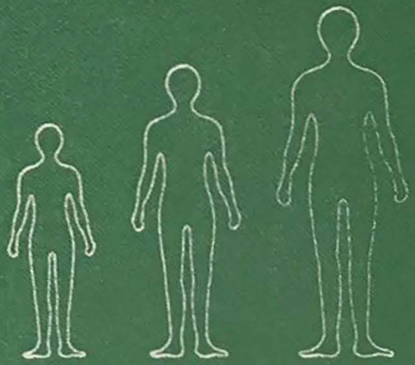
ATLAS OF CHILDREN'S GROWTH
Normal Variation and Growth Disorders

J. M. TANNER and R. H. WHITEHOUSE



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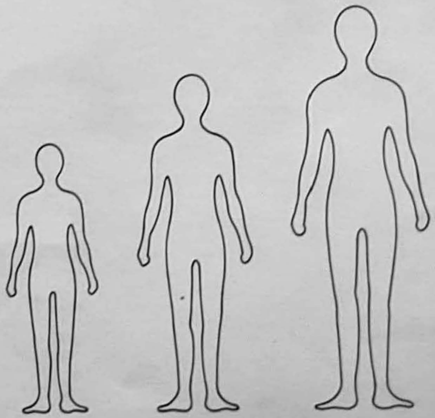

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Normal Variation and Growth Disorders

J. M. TANNER and R. H. WHITEHOUSE

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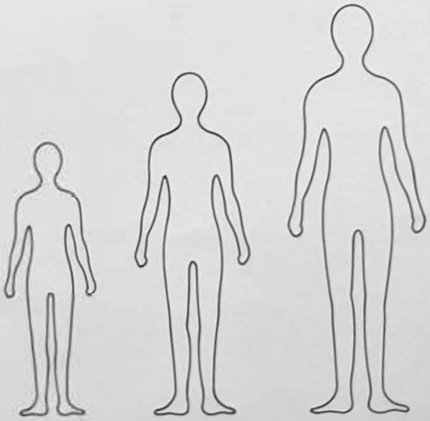

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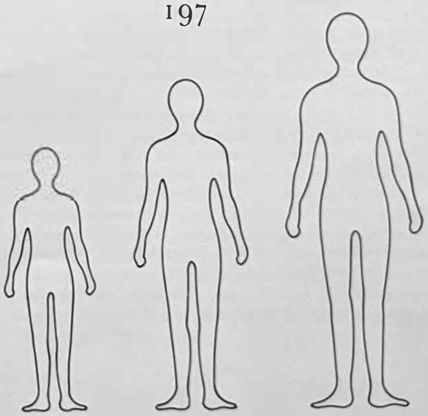


We began our longitudinal studies of normal children's growth in 1948 to find out how the great variation in size, shape and physique seen in young adult men and women developed during childhood. In particular we are thinking of the childhood origins of the various somatotypes of young adults described by Sheldon (1940). The children we studied from 1949 to 1970 were healthy, well-nourished boys and girls attending the usual schools, playing the usual games, and up to the usual activities. Much of the resulting data has been analysed in previous publications (Tanner, 1962; Tanner *et al*., 1966, 1975b, 1976b; Marshall and Tanner, 1969, 1970). When we moved to the Institute of Child Health in 1956, our horizons were enlarged by contact with the staff of the Hospital for Sick Children, in particular Professor Sir Alan Moncrieff and his then assistant Dr Frank Falkner. In 1960 we set up a clinic for the study of disorders of growth, applying the same techniques of measurement that we used in tracking the course of normal variation. This clinic became the chief centre in Great Britain for the treatment of growing hormone deficiency (Tanner *et al*., 1971) and the model for the eventual setting up of a network of similar clinics covering the whole United Kingdom. To these clinics come children with all sorts of growth disorders, from chondrodystrophies to Marfan's Syndrome, hereditary smallness to reversible psychosocially-induced growth hormone deficiency.

This book presents first, as introductory examples, the charts and pictures of a boy and girl followed from early childhood to maturity. Then follow the records of 32 normal boys and 20 normal girls, selected on the basis of their physique as young adults. They cover the whole range of body build represented in our sample (which consists of several hundred children). In Sheldon somatotype terms there are 12 boys high or fairly high in mesomorphy (from 25½3 to 34½3, nine high or fairly high in ectomorphy (1½1½7 to 334½), six high or fairly high in endomorphy (631½ to 42½4) and five boys with centrally placed somatotypes (344 to 443). The technique of somatotyping women is less well established than that of somatotyping men, and we have used, as Sheldon originally recommended, similar absolute criteria to those applied to men. Thus the range of mesomorphy is much reduced and the average level of endomorphy much increased. We present three girls high in mesomorphy (43½3 to 3½34), four high in ectomorphy (435 to 424), ten high in endomorphy (632 to 52½2) and three centrally placed somatotypes (4½34 to 4½33).

Each of these children has two pages to him- or herself. On the left-hand page are charts of the anthropometric measurements, skeletal maturity scores and somatotypes and on the right-hand page photogrammetric pictures. Fourteen measurements were taken on each child at each examination but only height, weight, sitting height, subischial leg length (stature less sitting height), biacromial (shoulder) width, biiliac (hip) width and triceps skinfold are presented here, together with height velocity, bone maturity score according to the RUS subdivision of the Tanner–Whitehouse system (Tanner *et al*., 1975b) and the young adult somatotype according to the Sheldon 1940 method. Every measurement on every occasion has been made by Whitehouse; bone maturity ratings were all by Whitehouse, somatotype and puberty ratings by Tanner. (The raw data for all measurements of these children are in the Appendix.)

The children were examined every 6 months (and every 3 months during puberty). We cannot reproduce the pictures for every occasion without making them unacceptably small. Front, side and back views were taken. Eight pictures of front and back views have been fitted onto the page. Most are at 2-year intervals, covering a span of 14 years; the remainder are at 18-month intervals, covering a 10-year span. As side views are narrower, they have been reproduced at intervals of 1 year. We ask forgiveness that occasional pictures, though no measurements, are missing; the mechanical apparatus did not quite match the human in its reliability.

In the last pages of Ch. 2 our central theme is more directly stated. Groups of 6-year-old boys and girls are presented, all of whom have the same, or nearly the same, somatotypes when young adults. We have chosen the most extreme adult somatotypes in the sample, so that a number of *very* mesomorphic, endomorphic and ectomorphic 6-year-olds are shown. The difficulty of assigning correct somatotypes at age 6 emerges clearly from this exercise. This difficulty may be because of real changes in shape between 6 and 18, or it may reflect a lack of the observer's sensitivity to small differences. To throw more light on this we give the correlation coefficients between 6-year-old and adult measurements (for the total material of this, plus another longitudinal series). Though these are high (except for the skinfold) they represent, perhaps, more a consistency of size than of shape. We therefore then examine shape changes in a similar way.

Chapter 3 examines in some detail the changes of puberty and their normal variations. Puberty is a very special time in growth, not only because of the development of the reproductive system, but because of the relatively large changes in size, shape and body composition that also take place then. Furthermore, it is at puberty that the individual differences in rates of maturing reveal their results most dramatically, making some children early in developing all the changes, and others late. In addition, the various events of puberty, such as the growth of breasts and the appearance and development of pubic hair do not take place in an invariable relationship one to another. In all normal girls the breast develops in much the same sequence of stages, but the time relationship between this sequence and the sequence of pubic hair development, for example, varies a good deal. So also does the actual rate at which each single sequence develops.

First, to illustrate the huge variation in timing of puberty, four boys aged 14·5 are shown, with all stages of puberty represented; their ages of peak height velocity varied from 12·5 to 16·5 years. Similarly, four girls aged 12·75 years are illustrated; their ages at menarche ranged from 11·6 to 14·7 years. Illustrations of the system for rating stages of breast, pubic hair and male genitalia are given, then a series of normal adolescents showing the different relationships of these various maturational sequences.

The intensity and duration of the adolescent growth spurt not only varies greatly from person to person but also is practically independent of the amount of growth before adolescence. Thus the correlation between height immediately before the spurt starts and mature height is only about 0·8, a value which reflects considerable alterations of individuals' height positions relative to their coevals as puberty progresses. We illustrate this by comparing the height curve and pictures of a boy whose spurt at puberty increased his centile position with those of a boy whose spurt decreased it. We then compare the growth curves and pictures of individuals who became relatively long- or short-legged at puberty and relatively wide- or narrow-shouldered.

In Ch. 4 some family data are shown. Growth represents the outcome of a continuous interaction between genetical and environmental forces; in circumstances where nutrition, exercise and the sense of individual security and social integration are assured, differences in growth between children reflect to a great degree differences in genetic endowment. In the face of undernutrition or other environmental pressures it is size which is primarily affected and shape which is preserved. The genotype has a stronger control over shape than over size. The first page of Ch. 4 illustrates this by considering two pairs of identical twins. The first pair are extremely similar in all respects, but the second pair differ slightly in size because one had had a better opportunity for growth in the prenatal period and weighed more at birth. In shape, however, they were so identical that practically nobody could distinguish between them, something of which they made full and amusing use at school.

The next pages show a pair of non-identical twin sisters followed from birth to maturity. They differ considerably in skeletal maturity and in age of puberty, but little in pre-pubertal and post-pubertal size. There follow two sets of siblings, one of three sisters, the other of two sisters and three brothers, illustrating the various growth patterns that may occur within a single family. Though the differences look and indeed are large, groups of siblings nevertheless show only about half the degree of variation in size, growth rate and maturity that is seen amongst unrelated girls or boys.

Chapter 5 presents some rather limited data on growth during young adulthood. We have followed a fairly small group of our subjects from 20–35 years, mostly at 5-year intervals.

In Ch. 6 we turn to abnormalities of growth. Naturally, being patients, the children differ in the age at which they were first seen, though after that time examinations of the majority were made regularly every 6 months or year (if not more frequently for reasons of treatment control). It was not possible to follow every subject however, and some, particularly of the chondrodystrophics, were only seen once. A few of these patients were measured by Peter Hughes and Noel Cameron, anthropometrists in the Department of Growth and Development, trained by and continuously comparing techniques with us.

First, four subjects with isolated growth hormone deficiency are presented, one with his monozygotic, but unaffected, twin. Two subjects with growth hormone plus gonadotrophin deficiencies of unknown origin are shown, and two with panhypopituitarism, in each case following removal of a craniopharyngioma. Except for the twin, and one other boy with isolated growth hormone deficiency, who are still young, all these subjects were treated until growth had ceased. There are then two subjects with primary hypothyroidism, showing the usual catch-up and final normal stature.

The commonest single cause for a child's referral to a Growth Disorder Clinic, in the case of boys at any rate, is short stature due to excessive delay in maturation, sometimes combined with a below average expectation of adult height due to inheritance. We designate this diagnosis Constitutional Growth Delay (or, in the Appendix, small/delay). Three subjects with this diagnosis are shown, all attain an ultimately normal adult height without treatment. Another group of basically normal subjects referred to the clinic are mostly girls, tall to a degree thought to constitute a social handicap. They are the daughters of tall parents, and in some cases the administration of oestradiol to reduce ultimate height may be justified, though whether it has any late side-effects is not really known. We include the record of one such tall girl, who remained untreated.

Silver–Russell Syndrome (Tanner *et al*., 1975a), a form of short stature associated with low birth-weight and sometimes bodily asymmetry, is represented by three subjects. Turner's Syndrome is illustrated by two subjects, and, because the facial and head-and-shoulders appearance is very characteristic, by a series of front and side face-and-shoulder views of 16 further subjects. Most of these are XO in karyotype, but two are XX/XO mosaics and one has an iso-X chromosome. Opposite are faces of children with Silver–Russell Syndrome, who also have a characteristic and very different look.

Short stature (the word "dwarfism" has for long been totally banished from our clinic, for mothers regard dwarfs as magical lapses of nature, suitable only for hammering gold in underground caverns, with a dose of the evil eye by no means necessarily dissipated by successful treatment with growth hormone); short stature, then, due to psychosocial stress is represented by three cases. In each of these, ill-treatment of the child by parents and family resulted in the switching off of growth hormone secretion (just as similar stress may result at a later age in cessation of menstruation). Removal to more congenial circumstances produced a renewed secretion of hormone and a catch-up in height exactly similar to that seen in treated idiopathic growth hormone deficiency.

Cases of coeliac syndrome should never really turn up at short stature clinics, but they do sometimes, for coeliac disease may be practically symptomless; the child may have nothing but short stature and a rather protuberant abdomen. We give one example of such a child, who showed an excellent and complete catch-up on a gluten-free diet. In our clinic any child whose short stature remains obstinately unexplained by history and tests gets a jejunal biopsy. Similarly, any undiagnosed girl has her karyotype examined whatever her state of physical development, for Turner mosaics, in particular, may have few signs except short stature. They may also have a normal percentage of Barr bodies. We have to thank Dr John Harries of the Department of Child Health, Institute of Child Health for the jejunal biopsies and Professor Paul Polani and his staff at Guy's Hospital for the karyotypes.

Our experience of the chondrodystrophies is limited: six cases of achondroplasia are presented in one double page of charts and pictures to give an idea of the range of variation seen and six cases of hypochondroplasia are presented in a little greater detail. There follow three cases of metaphyseal chondrodysplasia type McKusick (cartilage-hair hypoplasia) and one example each of dyschondrosteosis (Leri–Weil Syndrome), X-linked hypophosphatemic rickets, cerebral gigantism (Sotos' syndrome) and Marfan's Syndrome. Two subjects are shown who have the unusual syndrome of short trunk and long legs (without scoliosis) and are probably examples of Lenz' spondyloepiphyseal dysplasia tarda; and two cases of de Lange's Syndrome. Finally, there is a page showing children with the syndrome of Prader–Willi. It is perhaps appropriate for us to close with this disorder, for over the last 20 years Professor Andrea Prader has been for us an unerring guide through clinical paediatrics; his intellectual penetration, sensitivity and personal friendship have encouraged us continually in our endeavour to apply auxological methods to clinical problems.

The manner in which the measurements were taken is illustrated on the opposite page, and on page 4.

Instruments

Since the anthropometric instruments available when we began our study in 1948 were mostly unchanged since the nineteenth century and left much to be desired, we designed a new range, "Harpenden", now manufactured by Holtain Ltd., (of Crosswell, Crymmych, Wales). The stadiometer, for measuring height (Fig. 1) has a counterweighted head-board which maintains light contact with the subject's head as the measurer positions it. A rack and pinion gear up the side enables the measurement to be read directly from a digital counter, eliminating one of the chief sources of error. This counter may be arranged to read directly into a computer if desired, but in most work an immediate check of the value for reasonableness should be made, requiring either a human recorder who knows the rough value expected and calls "check" if he suspects an error, or else an on-line facility with inbuilt tables doing the same.

The anthropometer used for the measurement of biacromial and biiliac diameters (Figs 9 and 11), limb lengths and, until recently, sitting height, also has a rack and pinion gear with direct numerical read-out. The gear permits much easier and more precise movement of the arms of the anthropometer than in the old metal-to-metal or metal-to-plastic sleeve-friction types. Thus the measurer can hold the tips of the measuring arms as shown, palpating with his fingers the exact points required at the same time as moving the arms. During the last few years sitting height has been taken with a specially designed instrument (Fig. 3) which incorporates a stadiometer fixed to a table. The stadiometer can be moved forwards and back on the table so that it is in precise contact with the subject's back as he sits upright, whatever the length of his thigh. It incorporates a foot support whose height is adjustable so that the thighs can be positioned horizontally. Sitting height is a technically difficult measurement (though more reliable than the measurement of crown-to-pubes that figures in the older paediatric literature) and we find the machine increases both ease and reliability.

Supine length (Fig. 5 upper) is measured on a table which has a numerical counter attached to a gear down the side, and crown-rump length (Fig. 5 lower) is read on the same table. A recent modification (Davies and Holding, 1972), especially useful when measuring infants, is the addition of a cam to the moveable foot-board. This cam locks when a particular pressure of the foot-plate against the feet is reached; thereafter the foot-plate is fixed. The baby can then be removed from the table without fear of disturbing the reading. After the reading is taken, the foot-plate is released by flipping up the cam.

The skinfold caliper (Fig. 13, p. 4) was introduced in the early 1950s (Edwards *et al*., 1955; Tanner and Whitehouse, 1955). The jaws exert a pressure of 10g/mm^2 at all openings due to the design of the spring in relation to the fulcrum. The dial is calibrated in 0·2 mm, but readings can be estimated to the last completed 0·1 mm.

The photographs were taken with an aerial camera, the Williamson F24, fitted with a lens of focal length 20″ (normal children) or 14″ (growth disorder clinic patients) using 5½″ roll film. The film-drive and camera back were modified so that only one-third of the frame was exposed for each shot. This enables front, side and back views of a child to be recorded on one frame and economizes on film. Recently we have changed to a Hasselblad camera using continuous roll film and a 150 mm lens similarly modified.

Measurement Techniques

Height was measured as shown in Fig. 1. The subject, in underclothes, stood on the footplate of the stadiometer, with heels together and head in the Frankfort plane (i.e. with the lower border of the orbit in the same horizontal plane as the external auditory meatus). The top of the stadiometer, being counter-balanced, rested lightly on the subject's head. The subject then stretched upwards fully, aided by relaxing the shoulders and by the anthropometrist applying gentle pressure on the mastoid processes and encouraging him verbally. A recorder (now shown) watched that the heels did not come off the ground, and held them down if necessary. The height was read to the last completed millimetre. This technique minimizes variation in posture due to tiredness or boredom, which may otherwise amount to 10 mm or even 20 mm (Whitehouse *et al*., 1974). A good anthropometrist can repeat his reading to 3 mm or less on 95% of occasions, and two well-trained observers should seldom differ by more than 4 mm.

The accuracy of measurement is particularly important where calculation of increments or velocities of growth are made since there are two errors involved, which may summate. Casual observers without special training may differ in their measurements by 15 mm and two summating errors of this magnitude introduce large errors into a yearly velocities and make 3-monthly velocities meaningless.

Sitting height was also measured with the subject's back stretched up straight. If the anthropometer was used, he sat on a table top with his legs hanging down unsupported over the edge, with the back of his knees nearly but not quite touching the edge of the table. He stretched up as much as possible, aided by gentle upward pressure under the chin; but care was taken to see he did not contract the muscles of his buttocks or thighs. His head pushed up the horizontal arm of the anthropometer, and the counter of the instrument registered the result to the last completed millimetre. If the sitting height machine was used (Fig. 3) the same technique was followed, except that the subject's feet were well supported by a footplate located at a level such that his thighs rested lightly in contact with the table top of the machine in a horizontal plane.

Supine length was measured with the child lying on his back (Fig. 5 upper). One measurer held the child's head in the Frankfort plane and applied gentle lengthwise pressure to bring the top of his head into contact with the fixed headboard. A second measurer held the child's feet, toes pointing directly upwards, and, also pulling gently to stretch the child, brought the moveable foot-board to rest firmly against the child's heels.

Crown-rump length was measured with the child lying on his back with his knees bent to a right angle (Fig. 5 lower). One measurer held the child's head in the Frankfort plane and applied gentle lengthwise pressure to bring it into contact with the fixed headboard. A second measurer supported the child's legs and brought the moveable foot-board to rest against his buttocks.

Weight was taken using a beam balance. The subject was either in the nude, or in minimal underclothes, the weight of which was subtracted from the reading, usually by adjusting the zero of the machine to allow for it.

Biacromial diameter was taken as shown in Fig. 9. The subject stood with his shoulders relaxed to the point of slumping forward. This gives the maximum shoulder width. The measurer felt for the outside edge of the acromial process of the shoulder blade, then rested the inside edge of one anthropometer arm under one process and brought the other arm inwards until the inside edge of the other arm rested against the opposite process. The counter was then read to the last completed millimetre. This measurement can be regularly repeated to within 2 or 3 mm if the subject is posed correctly.

Biiliac diameter (Fig. 11) was taken similarly. The subject stood with heels together and the anthropometer arms were brought into contact with the top of the hip bone (iliac crest) where it sticks out most, i.e. where the hip diameter is greatest. The object was to measure the bone width only and strong pressure was put on the anthropometer blades to push aside any fat covering the bone. In obese people this is a difficult measurement to take accurately, but in most subjects the accuracy is similar to that of biacromial diameter. Triceps skinfold was measured in the manner described overleaf.

In addition to these measurements we routinely took upper arm, calf, thigh and head circumferences, biceps, subscapular and suprailiac skinfolds, bicondylar widths of humerus and femur, foot length and, in the Growth Disorder Clinic, lengths of upper arm, forearm, hand and tibia.

Construction of Charts

The *height charts* (Tanner and Whitehouse, 1976) (see Fig. 2) represent *longitudinal* standard centiles, not cross-sectional ones, which give an erroneous reading during the adolescent growth spurt. The longitudinal 50th centile rises more steeply at puberty than does the 50th centile constructed from cross-sectional surveys (Boas, 1930; Shuttleworth, 1937; Tanner, 1962, 1976; Tanner *et al*., 1966). The shape of our 50th centile curve has been determined from our longitudinal data, whereas the amplitude of the standards, given by the positions of the other centiles, is based, from age 5 upwards, on the much larger number of children (some 20,000) measured in a cross-sectional survey of randomly selected London schools in 1959 (Scott, 1961; Tanner *et al*., 1966). From birth to age 5 the number surveyed was smaller and came from longitudinal studies in London and Oxford; however, a more recent (1974–77) large-scale survey of representative areas in England organized by the Department of Health and Social Security gave almost identical values (Fox and Waterlow, pers. comm.); the same is true for age 5 upwards (Rona and Altman, 1977).

The centile lines represent accurately the growth of children who have their peak height velocity (see below) at the average age for this event (approximately 14·0 years in boys and 12·0 years in girls in the UK). Children with an earlier or later adolescent growth spurt will pursue courses "parallel" to these longitudinal centiles but rising earlier or later. We have not put in limits for earliness or lateness in the height-attained chart, as in the height velocity chart (discussed below), for fear of making the chart seem complicated. However, the shaded areas above the 97th and below the 3rd centiles represent the equivalent centiles of cross-sectionally derived standards and thus include the positions occupied by very large early-maturers and very small late-maturers (provided they are not so early and so large, or so late and so small, as to lie outside the 94% range of height for given age in the population). Thus a child's height may plot in the shaded area the first time he is seen without it being outside our conventional limits of normality (i.e. 94 out of 100 normals); but he should head in towards the centile lines from that time onwards.

The stages of pubertal development given in the chart are discussed in Chapter 3, p. 122. At each examination the pubertal stage is noted and plotted on the chart. The designation of early maturation as 97th centile and late maturation as 3rd centile is, of course, arbitrary: it could just as well have been the other way round. In following boys' puberty the size of testes is compared by manual palpation with the size of models presented in the Prader-Zachmann orchidometer (Zachmann *et al*., 1974). The two sizes charted represent (4 ml) the first clear sign of pubertal enlargement and (12 ml) the lowest volume ultimately reached by all normal boys. Testis size is not available for our normal boys.

The *weight charts* (Tanner and Whitehouse, 1976) (Fig. 8) are constructed in the same way as the height charts, using the same sources of data.

The *sitting height/leg length charts* (Fig. 4) are constructed in the same longitudinal manner as the height ones, but are based on more limited data, accumulated in a number of longitudinal studies conducted by the Department of Growth and Development over the last 25 years. Subischial leg length is simply stature less sitting height. The significance of the italicized section at the bottom of the chart is as follows. In judging whether the legs are out of proportion to the trunk one can use either the ratio leg length/sitting height, the regression of leg length on sitting height, or the difference between the standard deviation scores of leg length and sitting height. An objection to the first method is that it leaves one uncertain whether an abnormal value is due to the numerator or denominator. There are other objections of a more statistical nature (Tanner, 1949). With the second method (regression), the slope of the line may differ at different ages, and this is not easily accommodated in a single chart.

We have therefore chosen the third alternative and for this reason have used standard deviation lines instead of centiles in the main chart (since the distribution of these measurements at all ages is Normal, this introduces no error; the reader has only to remember that ±2·0SD corresponds approximately to the 97th and 3rd centiles, ±1·5SD to the 93rd and 7th centiles, ±1·0SD to approximately the 85th and 15th centiles, and ±0·5SD to the 70th and 30th, to enable him to translate SD scores into probabilities of being healthy). The SD scores of sitting height and leg length are obtained approximately from the graphical plot, or accurately from tables (Tanner, 1978). One is subtracted from the other and the resulting difference plotted in the italicized portion of the chart. The outer centile limits of normal for this difference are shown. Above the upper limit the legs

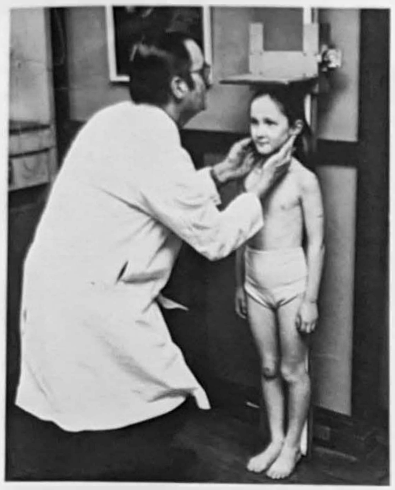


Fig. 1. Height, measured with the Harpenden Stadiometer.

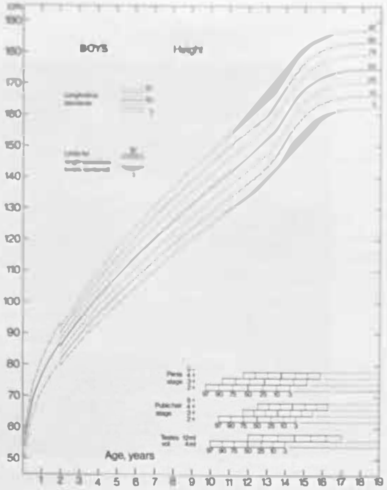


Fig. 2. Height chart (Tanner and Whitehouse, 1976).

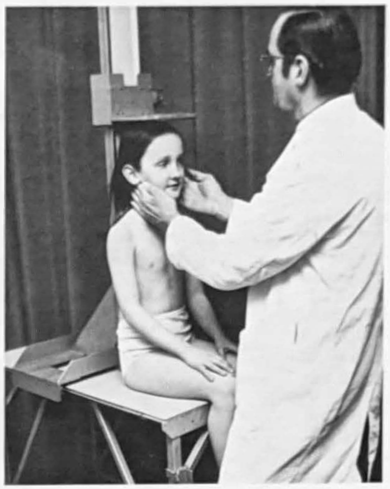


Fig. 3. Sitting height, measured with Holtain sitting height machine.

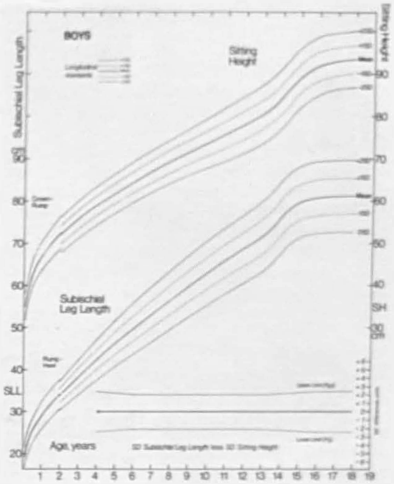


Fig. 4. Sitting height and subischial leg length chart.

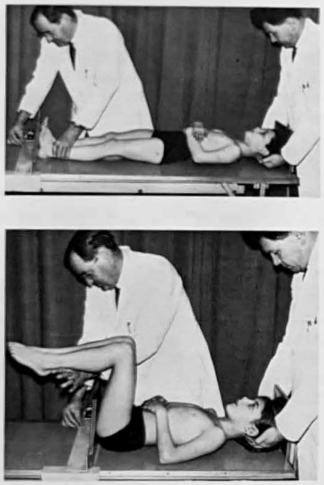


Fig. 5. Upper: Supine length, measured on the Holtain length table. Lower: Crown-rump length.

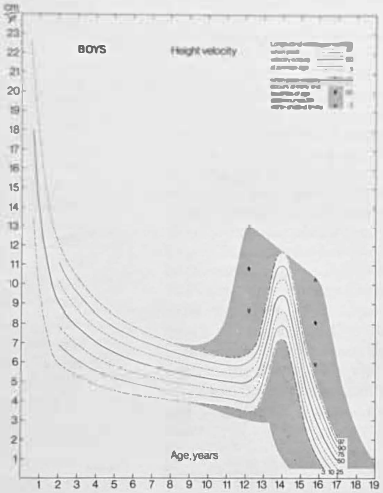


Fig. 6. Height velocity chart (Tanner and Whitehouse, 1976).

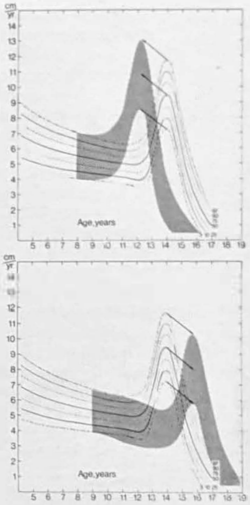


Fig. 7. Construction of longitudinal standards for height velocity (see text) (Tanner and Whitehouse, 1976).

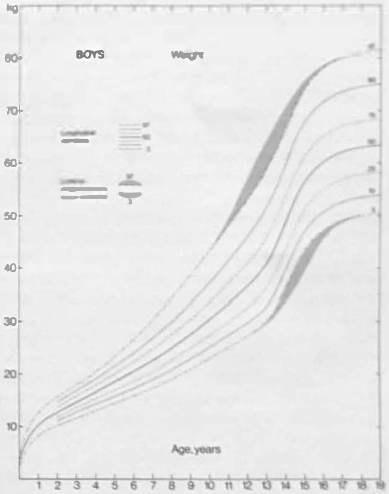


Fig. 8. Weight chart (Tanner and Whitehouse, 1976).

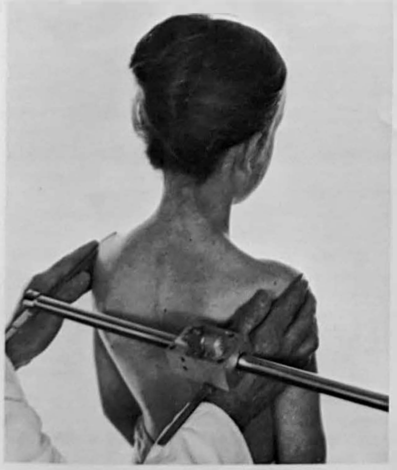


Fig. 9. Biacromial diameter, measured with the Harpenden anthropometer.

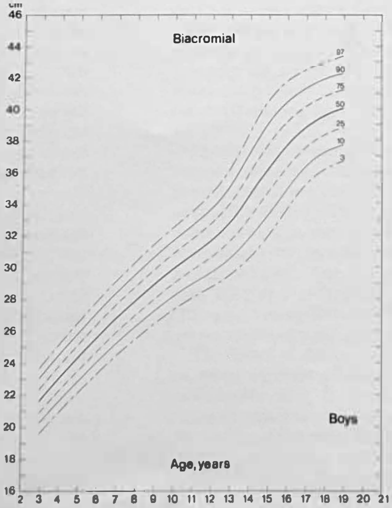


Fig. 10. Biacromial diameter chart.

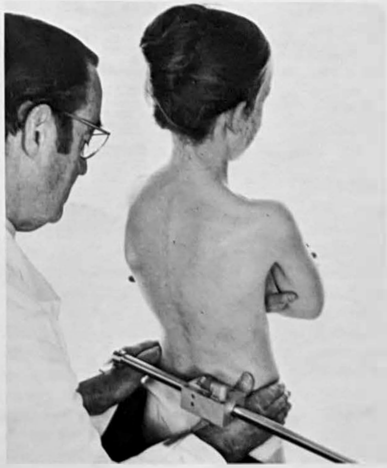


Fig. 11. Biiliac diameter, measured with the Harpenden anthropometer.

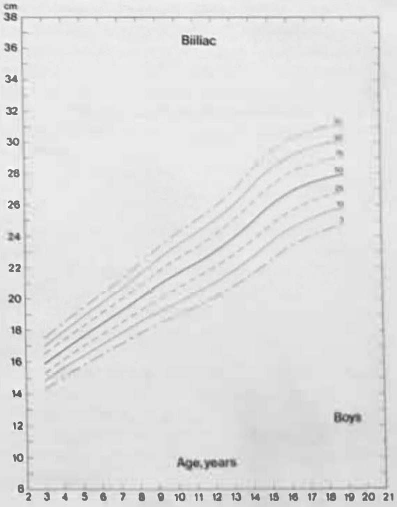


Fig. 12. Biiliac diameter chart.

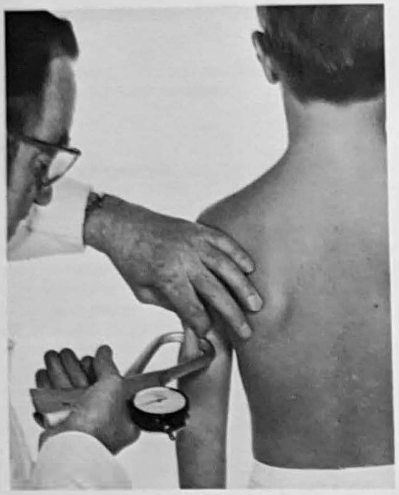


Fig. 13. Triceps skinfold, measured with the Holtain–Harpenden skinfold caliper.

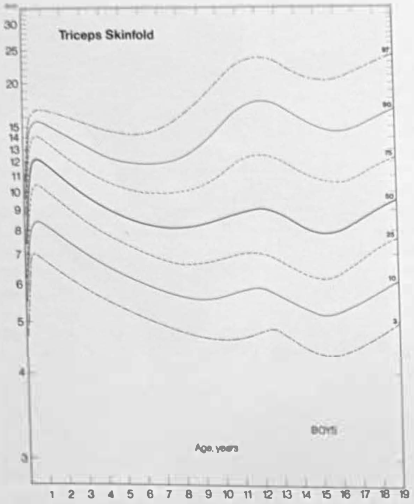


Fig. 14. Triceps skinfold chart (Tanner and Whitehouse, 1975).

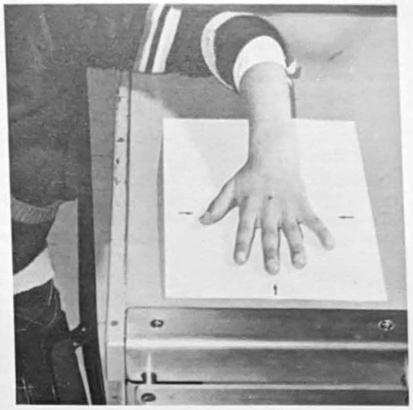


Fig. 15. Taking the radiograph of left hand and wrist.

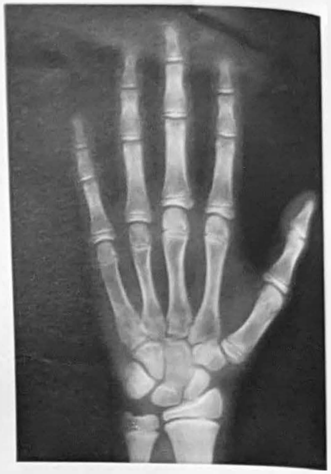


Fig. 16. Radiograph of left hand and wrist

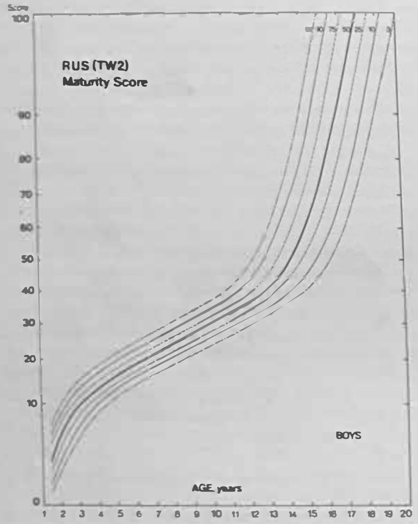


Fig. 17. RUS skeletal maturity chart (Tanner *et al.*, 1975b).

Bone	Rating	RUS score	Carpal score	20-bone score
Radius	F	59		48
Ulna	E	40		39
Metacarpal I	E	21		19
III	F	19		16
V	F	18		17
Proximal phalanx I	E	17		15
III	E	15		13
V	E	15		13
Middle phalanx III	E	15		13
V	E	15		14
Distal phalanx I	E	17		14
III	F	18		16
V	F	18		16
Capitate	H		214	116
Hamate	G		159	81
Triquetral	G		102	45
Lunate	F		84	36
Scaphoid	E		71	30
Trapezium	E		66	28
Trapezoid	F		77	32
		—	—	—
20-bone score		—	—	621
RUS score		287	—	—
Carpal score		—	773	—
20-bone centile		—	—	85
RUS centile		75	—	—
Carpal centile		—	95	—
20-bone bone age		—	—	10·2
RUS bone age		9·5	—	—
Carpal bone age		—	10·6	—

Fig. 18. Example of assignment of bone maturity scores.

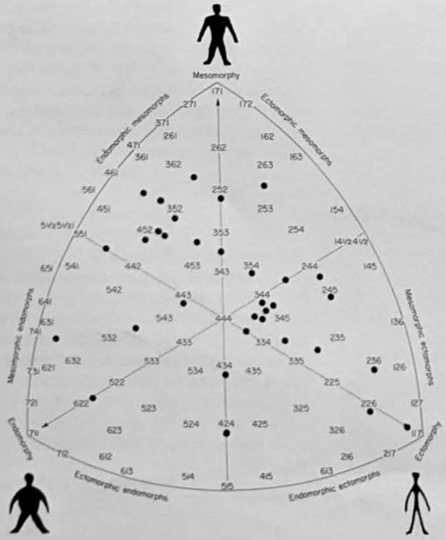


Fig. 19. Somatotype chart with the 33 normal boys plotted.

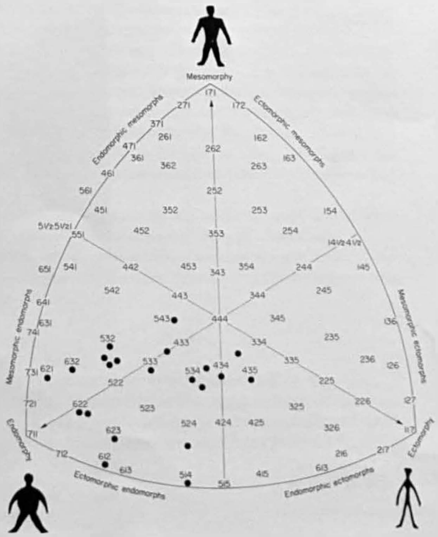


Fig. 20. Somatotype chart with the 21 normal girls plotted.

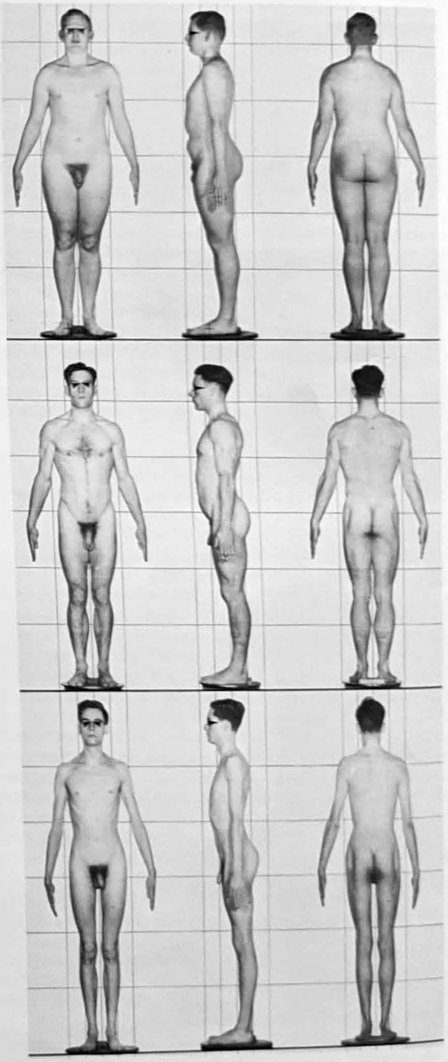


Fig 21. Three extremes of the somatotype distribution: endomorphy, mesomorphy and ectomorphy with somatotypes 632; 1½72; 1½1½7 respectively.

are abnormally long; below the lower, abnormally short. This is true for any given value of sitting height; one could have a very short sitting height but still too-short-to-match legs. The fact that these limit lines vary a little in their position takes care of the difficulty raised by the regression varying somewhat with age.

The *biacromial diameter* and *biiliac diameter charts* (Figs 10 and 12) are based on the same data as the sitting height chart. However, they are cross-sectional, not longitudinal.

For the *height velocity charts* (Fig. 6) height velocity was calculated whenever possible from increments over periods of approximately one whole year. This is because of seasonal effects on growth, which cause children on average to grow faster in spring and early summer than in late autumn and winter. The difference in rate may be considerable (Marshall, 1971, 1975). Thus the standards for growth velocity (Tanner *et al.*, 1966; Tanner and Whitehouse, 1976) are only strictly appropriate to periods of a year. If shorter periods are used the limits of normal are wider, both because of the seasonal effects and because the inevitable, if small, error of measurement, which is the same for each occasion, plays a proportionately larger role in forming the apparent increment.

In the normal children measurements were made every 6 months. The whole-year increments were calculated successively; thus the increment from age 6·0 to 7·0 was calculated and plotted at its mid-point 6·5; the increment from age 6·5 to 7·5 was plotted at 7·0; the increment from 7·0 to 8·0 plotted at 7·5 and so on. Each actual increment was, of course, converted to its rate in cm/year.

The form of the chart needs a little explanation, at least over puberty. The marked, unshaded, centiles represent the situation for the cohort of boys (or girls) all of whom have their peak height velocity at exactly the average age for this event (boys 14·0; girls 12·0 years). The 95% range of age over which the peak occurs, however, extends 1·8 years before and 1·8 years after this central age. The shaded centiles represent the situations for the cohorts of boys 2SD early and 2SD late. Figure 7 illustrates how these shaded portions were constructed. Early-maturing boys have a higher peak height velocity than boys who mature at the average age, and late-maturing boys have a lower peak height velocity. Both the shaded areas of Fig. 7 have been put in in Fig. 6. The symbols in Fig. 6 represent the 97th, 50th and 3rd centiles of peak height velocity when the peaks take place 1·8 years early and 1·8 years late. Thus early-maturing boys have curves which fall within the shaded area to the left of the central peak and late-maturing boys have curves falling in the shaded area to the right of the peak. Curves which fall outside the shaded areas are abnormal, either in intensity or in timing, or both.

Triceps skinfold (Fig. 13) was measured by picking up a fold of skin and subcutaneous tissue between the thumb and forefinger, initially placed about 2 cm apart on the skin, and pinching the fold away from the underlying muscle in the manner shown in the figure. The caliper was held as illustrated, the jaws were applied to the skinfold just under the pinch point and the right hand was allowed to relax entirely its grip on the handle so that the jaws could exert their full pressure. The left hand maintained the pinch throughout the measurement. This usually results in a stable reading up to about 20 mm, but above this the measurement registered sometimes decreases as the measurer watches the dial. A firmer grip by the left hand may prevent this; if not, then the reading is taken 2 s after the caliper is applied. The dial of the caliper illustrated was calibrated to 0·2 mm but it was simple to estimate the measurement to the last completed 0·1 mm.

The triceps skinfold was measured halfway down the left upper arm, which hung relaxed at the subject's side. The tip of the acromial process and the olecranon were palpated, and a point halfway between was marked on the skin. The skinfold was picked up over the posterior surface of the triceps muscle in a vertical line passing upwards from the olecranon in the axis of the limb, and the caliper jaws were applied at the marked level. Care has to be taken to locate the site right on the back of the arm, truly above the olecranon, for different values are obtained halfway round the arm (Ruiz *et al.*, 1971). The reliability of this measurement is lower at higher values than at lower ones, but as a log transformation of the measurement is used (Edwards *et al.*, 1955) this effect disappears. However, the variation between measurers is considerably higher than the variation of a single measurer; for skilled measurers 95% of replicates fall within the range of about 10% when different measurers are concerned, and within a range of about 5% when only one measurer is involved.

The chart for triceps skinfold (Fig. 14: Tanner and Whitehouse, 1975) gives the usual centiles, and is based on some 20,000 London children measured in 1965 from age 5 upwards, with children measured in the Midlands from 0 to 5. Both log transforms and untransformed scales are given. It must be emphasized that these charts represent the situation as it exists in the British population, not the ideal norm. In a nutritionally ideal society probably no child would be above the 75th centile, and none below the 5th. (Charts are obtainable from Castlemead Publications, Hertford, Herts.)

Skeletal Maturity

Because of the great variation in rate of maturing amongst children, some measure is necessary of whether a child is early or late in his progress towards maturity. The most useful measure is skeletal maturity, or *bone age*, and we have estimated this from radiographs of the hand and wrist taken as shown in Figs 15 and 16. The total dose of radiation involved is about 4 millirads (the same extra amount that a child living at sea level inevitably receives during a 2-week holiday in the mountains, since natural radiation increases with altitude). Though current UK regulations may be held to forbid any X-rays being administered to a normal child under 16 years of age (this is disputed and has never been tested in the courts) this was not the case when the X-rays reported here were taken.

The method by which a maturity score is assigned to a given X-ray appearance is discussed at length elsewhere (Tanner *et al.*, 1975b). Each of 20 bones is compared in appearance with a series of standard plates illustrating 7 or 8 successive stages of maturation. Each stage of each bone has a score assigned it (on defined mathematical grounds) and these are added up to give the *bone maturity score*. The individual bone scores are different according to whether all 20 bones are used, or the subsystems consisting (i) of radius, ulna, metacarpals and phalanges (RUS) and (ii) the seven carpal bones. Figure 18 illustrates how the scores are assigned and added. In this book we use exclusively the RUS score (RUS, TWII system). The RUS bone maturity score varies from 0 to 100 and the centiles given in the chart (Fig. 17) have just the same interpretation as centiles for height at a given age. They are, however, cross-sectional centiles.

Bone ages, also based on the RUS ratings only, are also plotted in some of the charts. The bone age of a given child is simply that age at which the average, 50th centile, child shows the given child's radiographic appearances, i.e. has the given child's RUS maturity score.

Somatotypes

Lastly, we have assigned Sheldon somatotypes to the normal subjects when they reached young adulthood. A full description of Sheldon's original system will be found in two of his books (Sheldon, 1940, 1954) and an appraisal of this and other systems of classifying physique in a modern textbook of human biology (Tanner, 1977). Basically the system ignores size and considers body shape and tissue composition as revealed in photographs of the sort we have taken (Dupertuis and Tanner, 1950) and by the index height/weight$^{1/3}$.

Physique is considered to consist of a mixture of three components named endomorphy, mesomorphy and ectomorphy, each present to some degree in everybody. Each is rated on a sale of 1 to 7 (though in practice skilled somatotypers use half divisions, creating a 13-point scale). The somatotype is given by a set of three numerals representing the degrees of endomorphy, mesomorphy and ectomorphy respectively. The components are not wholly independent of each other (i.e. orthogonal) but partly negatively correlated (i.e. oblique). In consequence the somatotypes 226, 236, and 326 exist but not the combinations of 246 or 426.

The nature of the components is best described by referring to examples of their extremes shown in Fig. 21. The extreme in endomorphy (7–1–1) approaches the spherical as nearly as is humanly possible; he has a round head, a large fat abdomen predominating over his thorax, and weak floppy penguin-like arms and legs, with much fat in the upper arm and thigh, but slender wrists and ankles. Relative to his general size he has a large liver, spleen and, it is said, gut, also large lungs and a heart shaped differently from those of the other extreme physiques. He has a great deal of subcutaneous fat and might be simply called a fat man were it not that his whole body, including his thoracic and pelvic skeleton, is relatively greater in the antero-posterior than in the transverse direction. When starved, he becomes, in Sheldon's phrase, simply a starved endomorph, not somebody high in ectomorphy or mesomorphy. It seems that fatness is related to this build more or less inevitably, and it is thought that the amount of weight put on as a person gets older is fairly directly related to his rating in endomorphy, though the trend can be delayed by dieting and exercise.

The extreme in mesomorphy is the classical Hercules. In him, muscle and bone predominate. He has a cubical massive head, broad shoulders and chest, and heavily muscled arms and legs, with the distal segments strong in relation to the proximal. Relative to his size his heart muscle is large. He has a minimal amount of subcutaneous fat and the antero-posterior diameters of his body are small.

The extreme in ectomorphy is the linear man; he has a thin peaked face with a receding chin and high forehead, a thin, narrow chest and abdomen, a narrow heart and spindly arms and legs. He has neither much muscle nor much subcutaneous fat, but, relative to his size, a large skin area and a large nervous system.

Naturally, the vast majority of people are not extremes like these, but have a moderate amount of each component. Thus the common somatotypes are 3–4–4; 4–3–3; or 3–5–2.

Somatotyping, though a subjective procedure (meaning that it involves intelligent judgement) is highly reliable in practised hands, raters very seldom differing by more than 1 unit. A key file of known somatotypes for comparison is an advantage, however, and we have one for male somatotypes in the Department of Growth and Development. The subjects are students, army cadets and others, with somatotypes assigned in doubtful cases in consultation with Dr Sheldon himself.

Representation of the distribution of these partially related components on a two-dimensional surface poses some problems, conventionally resolved in the triangular chart shown in Fig. 19. The component for increasing endomorphy runs to the southwest, mesomorphy to the north and ectomorphy to the southeast. The various somatotypes are placed as indicated. We have plotted on Fig. 19 the somatotypes of each of the 33 normal boys whose data are presented here; where the dots coincided we have separated them slightly. It may be dimly perceived that we have chosen a stratified sample divided into four clusters, though our material was not sufficiently extensive to give us greater discrimination between each cluster.

Somatotypes were set up by reference to males, and the somatotyping of women is less well developed and documented. We have followed Sheldon in using the male system as near unchanged as possible, which results in a greatly different distribution of somatotypes in women from that in men. Most women are 4 or over in endomorphy and 4 or less in mesomorphy. Consequently, while the normative distribution for men in the chart is represented by dots all over the surface, with a higher concentration at the centre, like a multivariate normal distribution, that for women has its highest concentration in the southwest corner, in the 533 area. In Fig. 20 are plotted the somatotypes of the 21 normal girls whose growth is described below.

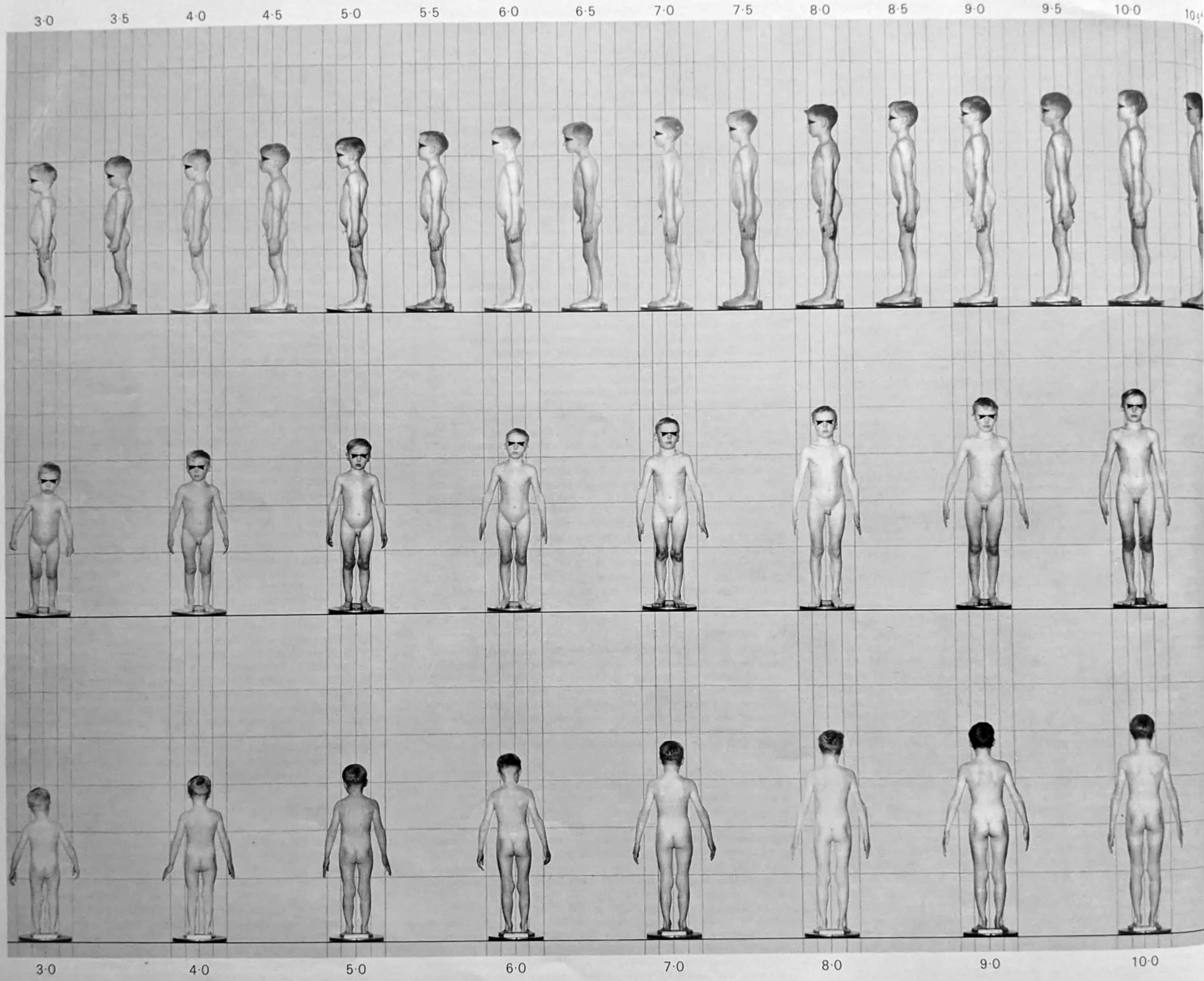
The Subjects

First we present, overleaf, a photographic record of the growth of an individual boy, from age 3 to 18, using the double page to reproduce front and back views each year, and side views every 6 months. The adolescent growth spurt can be clearly seen by looking at the curve described by the top of the head, especially if the page is turned sideways. The next pair of pages gives the boy's growth charts together with the charts of a girl similarly followed, and the subsequent pages the pictures of this girl from 2·5 years to 16 years, with a final picture at age 20. In her pictures also the adolescent growth spurt is easily identifiable.

There follow the 32 normal boys and 20 normal girls. Brief comments on each subject's growth pattern and physique are given in the text beneath the charts.

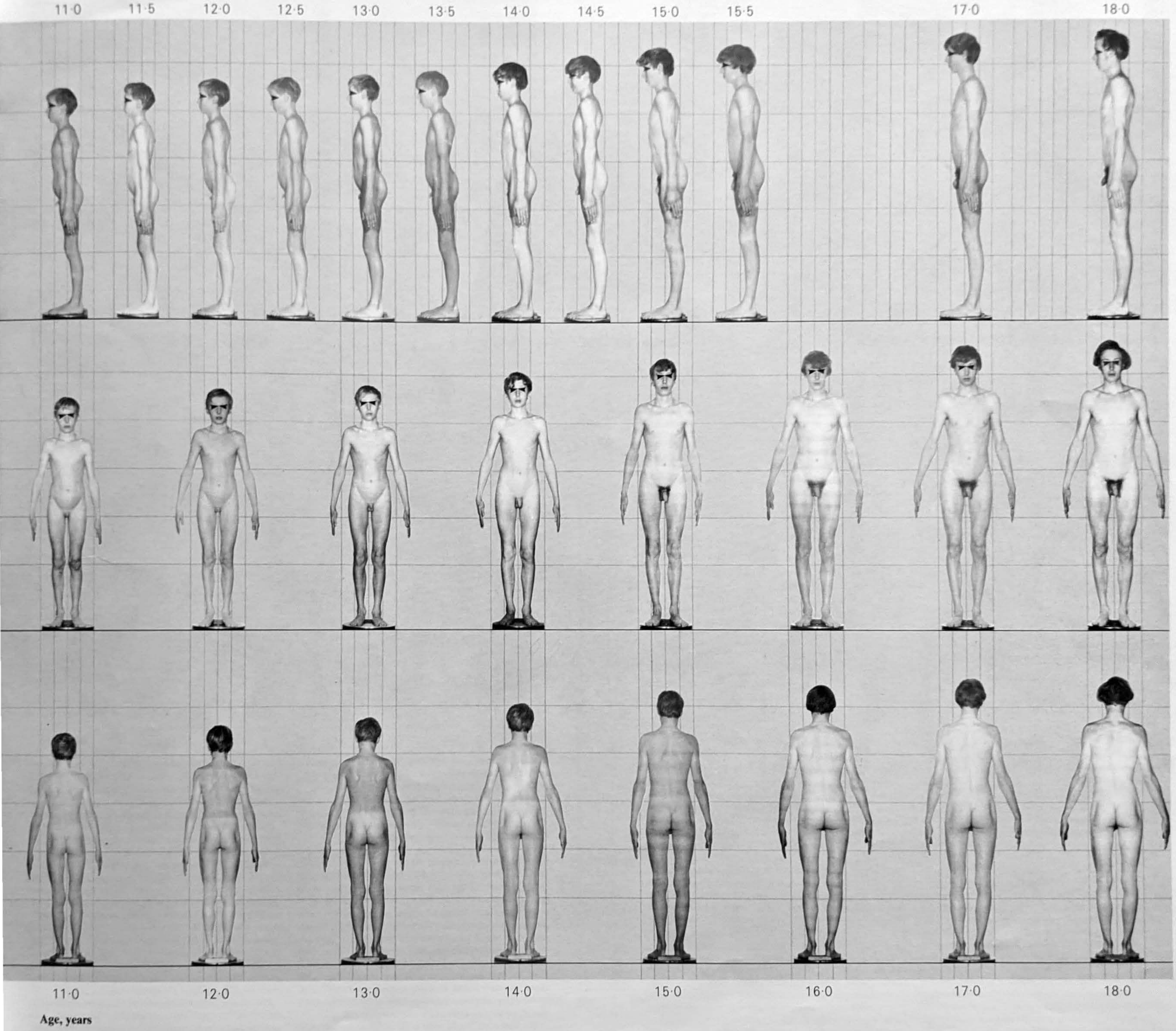
Normal Boy

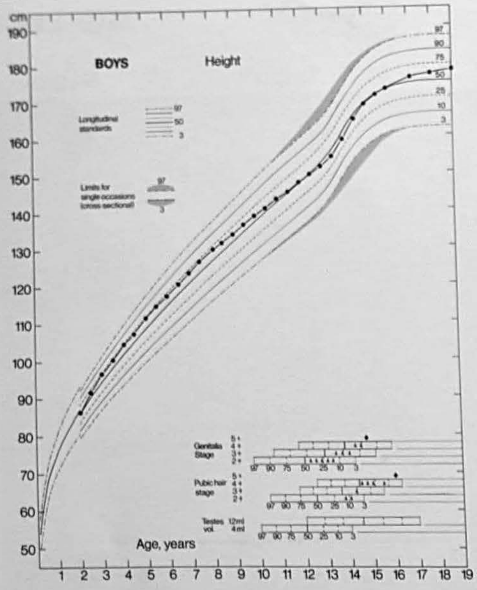
Subject No. 1

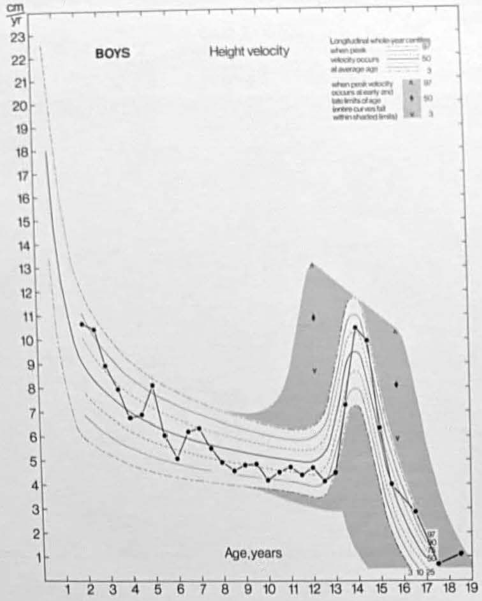


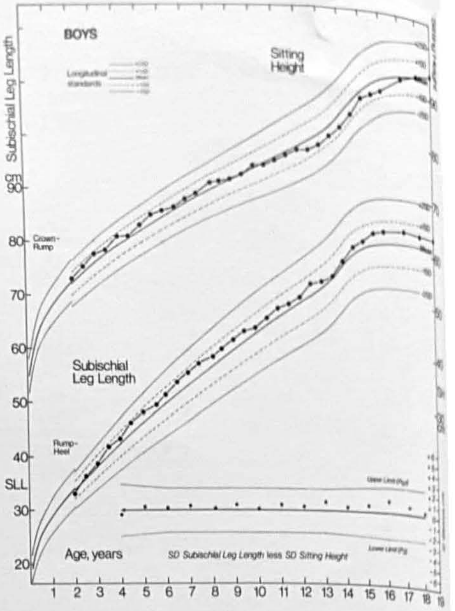
Normal boy, from age 3 to 18; front and back views each year, side views every 6 months, somatotype 2½44.

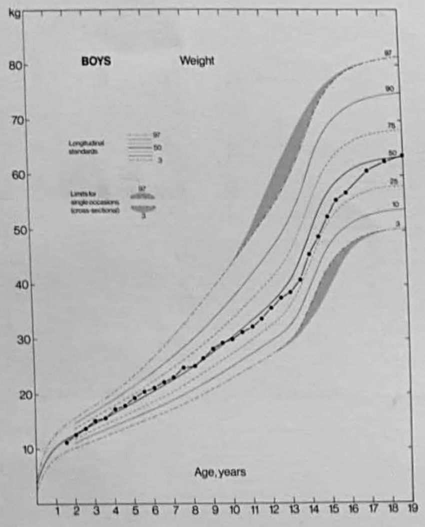
Normal Boy *Subject No. 1*

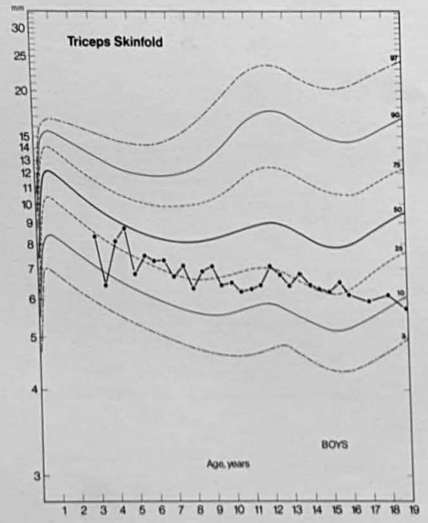


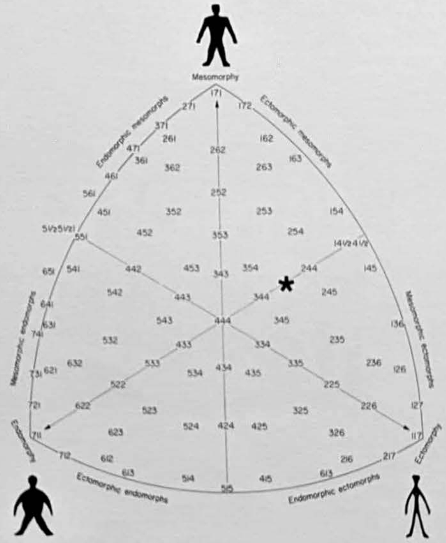


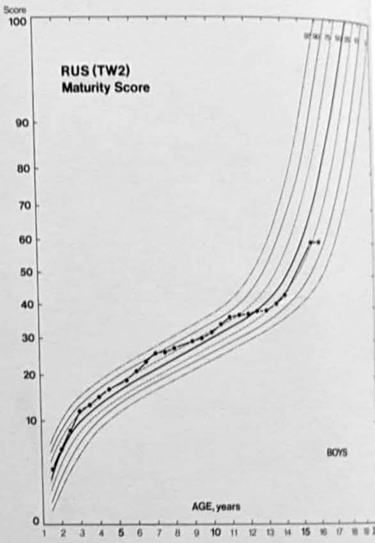


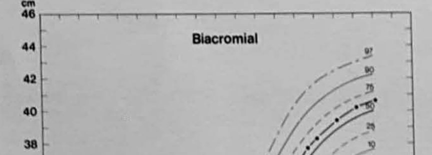


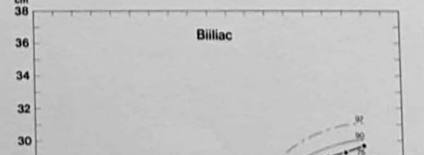












Normal Boy

Subject No.

The charts show some important features of the growth of subject no. 1 whose pictures are on pp. 6 and 7. Height at the first occasion of measurement, at age 2, is at the 50th centile; it rises to the 75th centile, then very gradually falls to the 50th again just before the adolescent growth spurt starts at age 13. The spurt is slightly greater than average in effect so that the final mature height is at about the 60th centile.

The height velocity chart (top centre) shows the course of height growth in more detail. At first high, the velocity falls (as a high velocity is bound to do or a giant will result), to reach the 25th centile in the years before the spurt. There is one point of surprisingly high velocity, in the interval 4·5 to 5·5 years. It is unlikely, though not impossible, that this represents merely measurement error: the velocity is about 1·0 cm/year more than might be expected and this would require two errors, in opposite directions, each amounting to 0·5 cm. Even one such error occurs very rarely in this measurer's reliability trials. Furthermore, the same rapid increase at this age is also shown in sitting height. Probably it represents a small catch-up following some minor slowing down in the interval 4 to 5, though we have no explanation why this occurred.

The adolescent height spurt is typical in shape but above average in its peak value, which reaches the 75th centile. The peak occurs at exactly the average time; this subject is neither an early nor a late developer.

The sitting height/leg length chart (top right) shows a boy of nearly average trunk/limb proportions. Both measuremen follow the same curve as height, with leg length always a litt greater from age 5. The difference between the SD scores typically about +0·4, though at 16 years it is +1·2 due to t relatively earlier spurt in leg length than in sitting height.

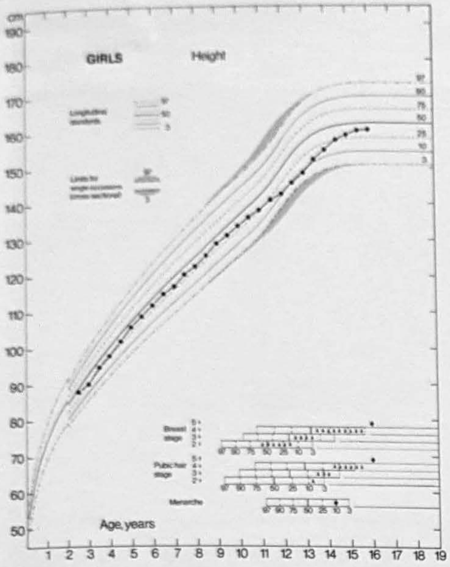
Biacromial diameter is very consistently at the 60th cent throughout, and the biiliac diameter rises gradually from t 50th at 3 years to the 80th at maturity.

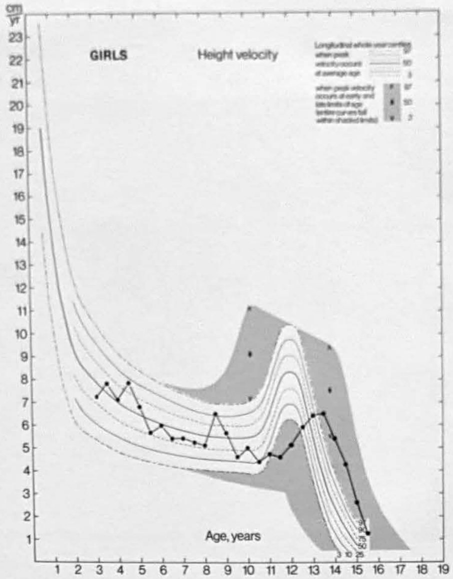
Weight is equally consistent; it stays at the 50th centile fro age 1·5 to 11, decreases slightly in centile position duri puberty, and returns to the 50th at 19. Triceps skinfo (adjacent to weight) is consistent to an unusual degree; it is the 25th from 3 to 16, but then the fat, instead of beginning increase in thickness after the period of male pubertal lo continues to diminish, so that the centile falls to the 10th. T is practically the only unusual feature in this subject's grow

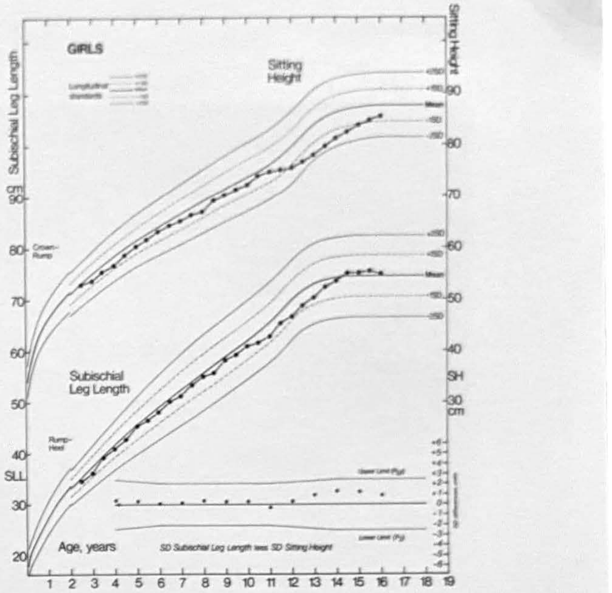
Skeletal maturity (centre right) lies at the 75th centile befo puberty, but increases very little from 11 to 13. It thus falls reach the 25th centile at 13 and it is still there at 16.

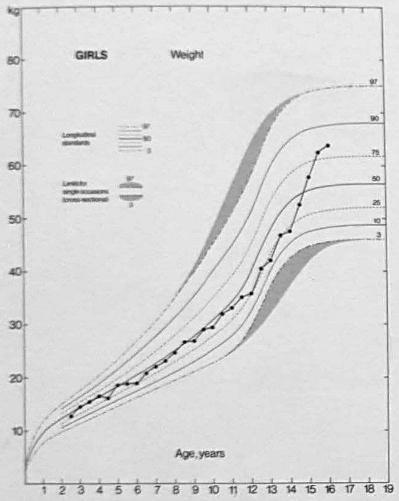
The development of secondary sex characters, shown at t bottom of the height chart, occurs later than average, bo genitalia and pubic hair stages averaging about the 25th cent

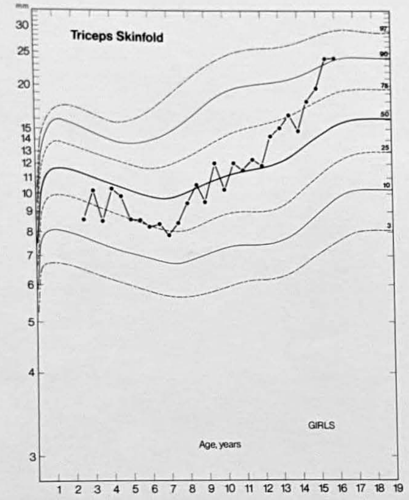
The pictures show the same consistency in body shape t is revealed in the growth charts. The adolescent spurt can clearly seen, especially in the successive side views. T subject's somatotype is 2½44.

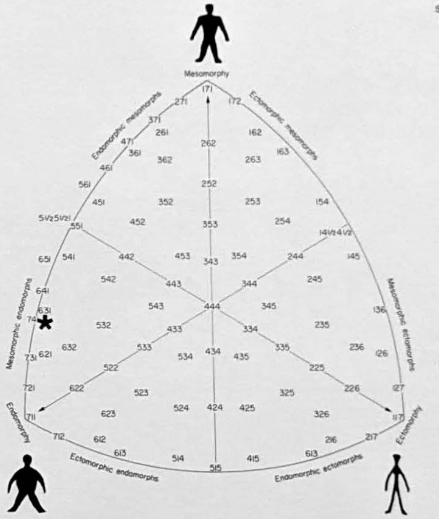


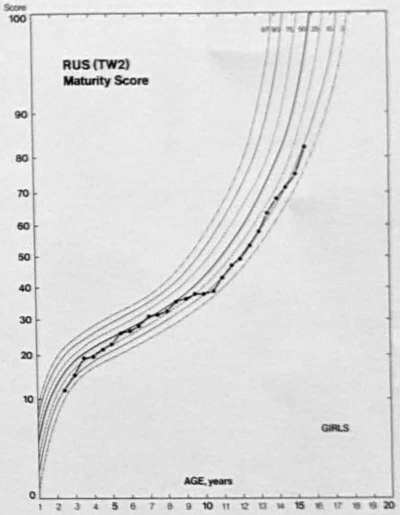


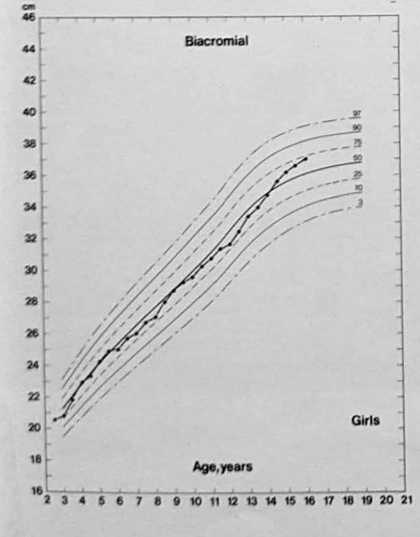


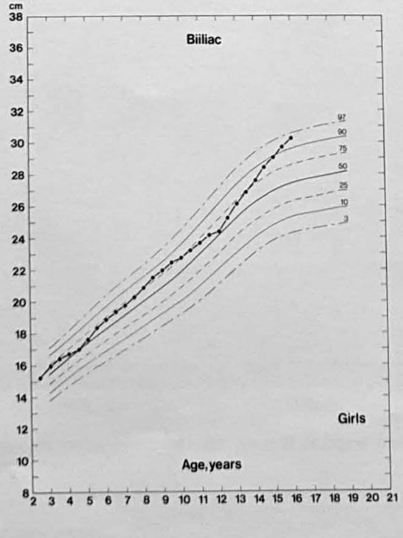












Normal Girl

Subject No. 2

Our first girl, has growth curves which are a little less close to average than those of the boy on the opposite page. Her height is consistent enough; it was at the 40th centile when she was first seen at age 2·5 and was at the 40th again at maturity, aged 16. She has a late adolescent growth spurt, however, so that her height drops temporarily from the 40th to the 10th. Her height velocity falls gradually from a little above the 50th to about the 25th with one odd value at age 8·5; perhaps again of a magnitude too great to be accounted for by measurement error. It is due to a low value of height at age 8·0, when sitting height, a quite independent measurement, also had a value lower than expected. Thus there may have been an unusual slowing down of growth from 7·5 to 8, followed by a catch-up from 8 to 8·5 which returned her onto her regular growth curve.

The adolescent growth spurt starts at about 11·5 and reaches a rather low peak at 13·5, which is 1·5 years later than average. The peak is at about the 25th centile, as may be seen by drawing lines between the marks representing the 97th, 50th and 3rd centile peaks for early, average and late maturers and filling in the other centile peak positions by parallel lines.

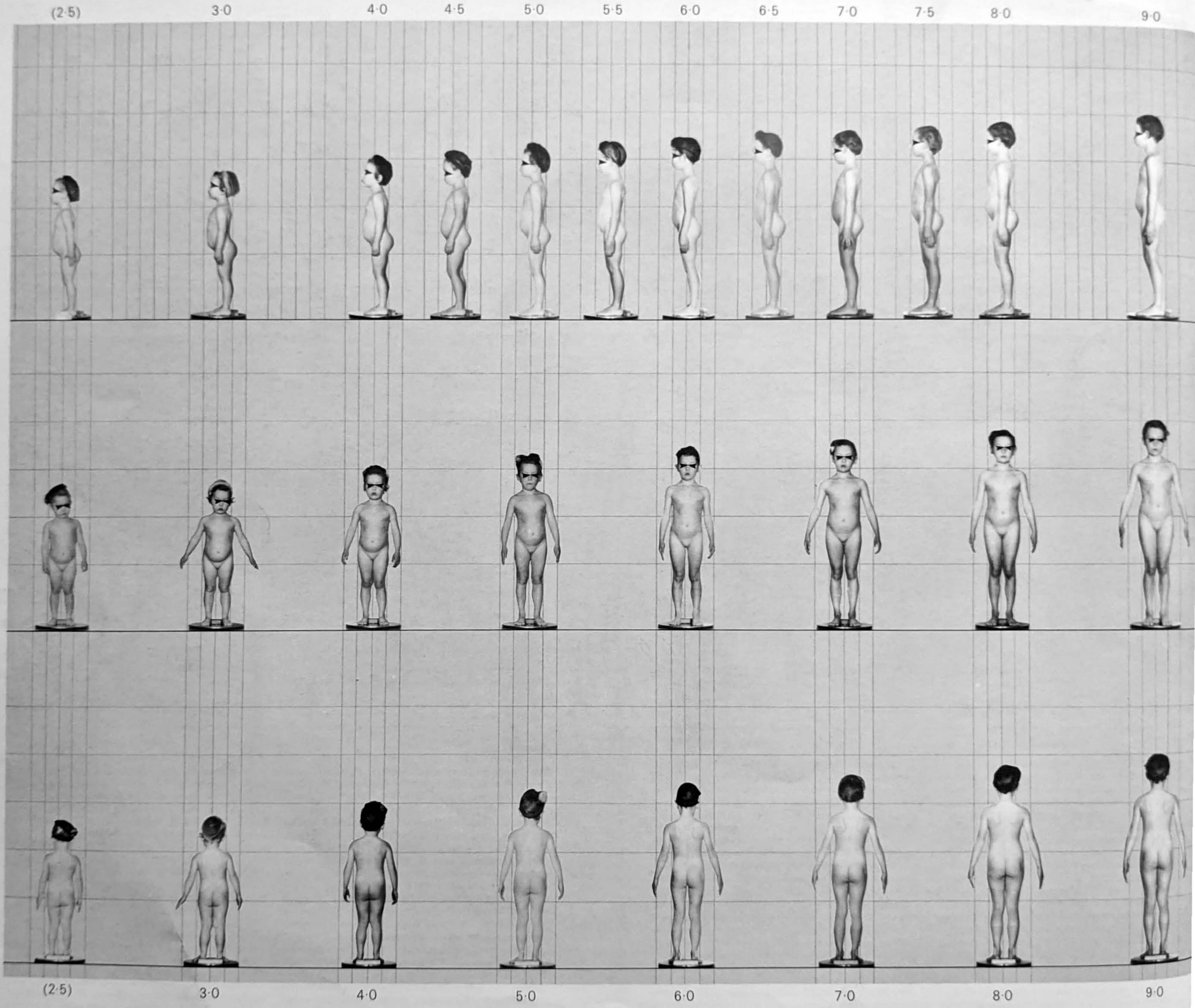
Sitting height and leg length show the same late spurt. Both are around the 40th centile, like height, till age 10; then both drop, the sitting height to the 3rd centile (−2 SD) and leg length to about the 30th (−1 SD). The spurt in leg length begins a little earlier than that of sitting height, and this largely accounts for the difference between their lowest centile positions. Thus while leg length SD less sitting height SD is 0·2 at age 12, it rises to 1·0 at 13 and 1·3 at 14 (implying relatively long legs) before dropping again to 0·8 at 16, as the sitting height spurt restores the proportion towards what it was before puberty.

Biacromial diameter is consistently around the 40th–50th centiles, until a greater-than-average adolescent biacromial spurt carries it to nearly the 75th. The biiliac diameter also has a greater than average spurt; from being mostly around the 75th centile it rises to nearly the 97th. Thus the spurt is relatively much greater in body breadths than in height.

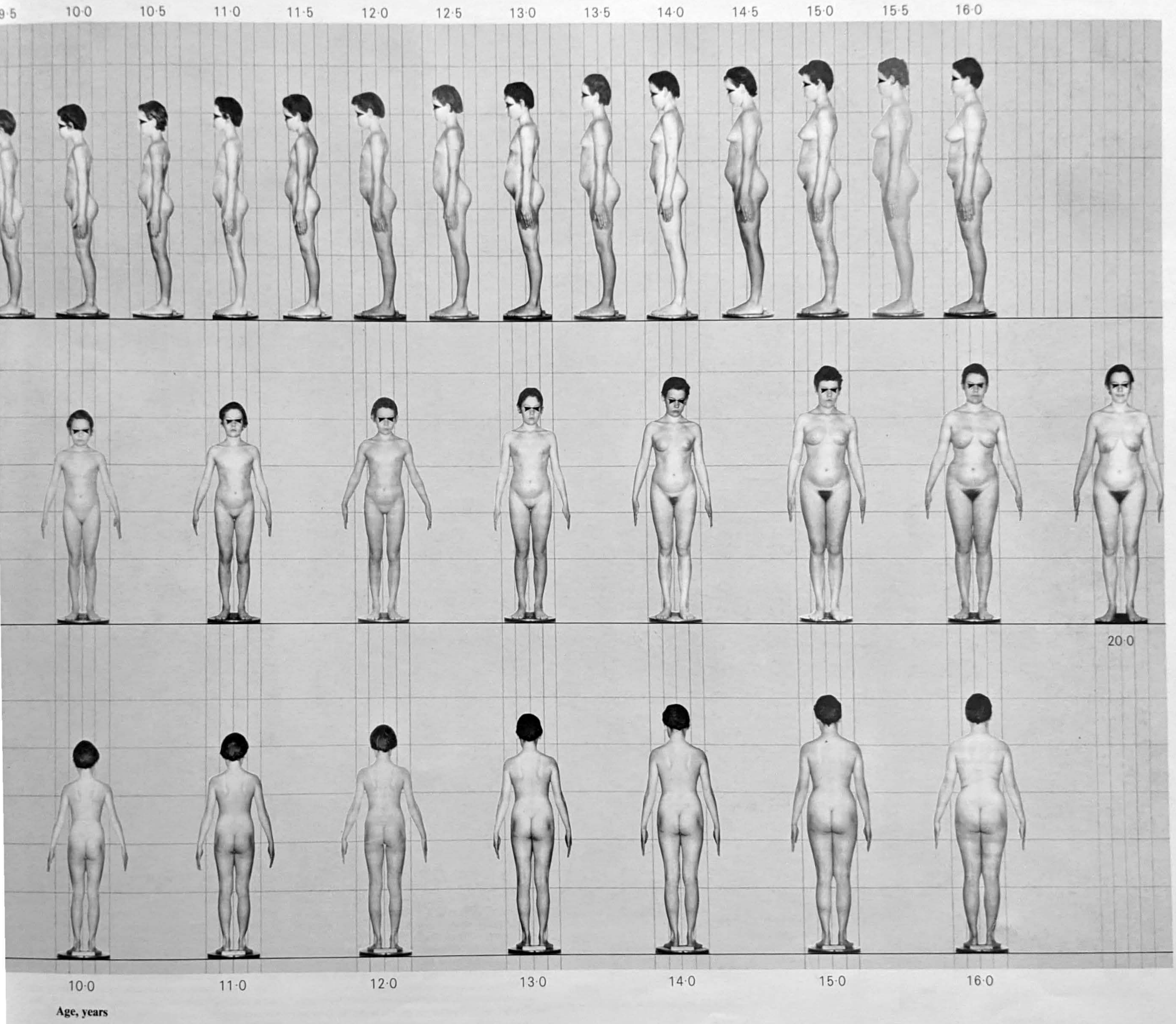
Weight is consistently between the 25th and 50th until adolescence, when it rises to the 80th. Triceps skinfold shows the same late rise, from 50th to 90th.

Skeletal maturity is around the 25th–50th from age 3 to 9, but then drops to the 10th where it stays till our last value at 15·5. Menarche is at 14·3, also at the 10th centile. Pubic hair stages average about the 10th and breast stages the 25th.

The pictures on pp. 10 and 11 show the adolescent growth spurt well. The subject's somatotype is 631.



Normal girl, front and back views each year from 2·5 to 16 years with final height at 20 years, side views every 6 months, somatotype 631.


9·5
10·0
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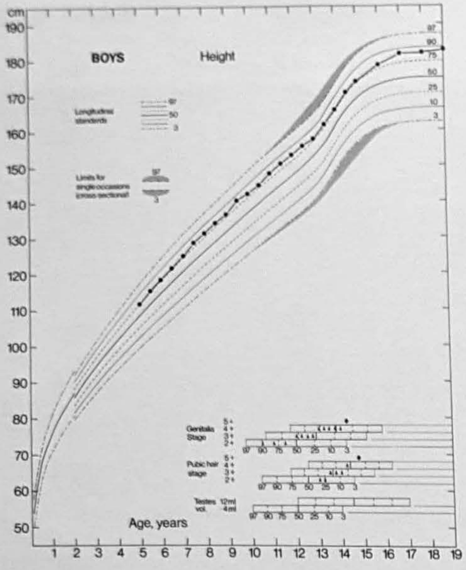
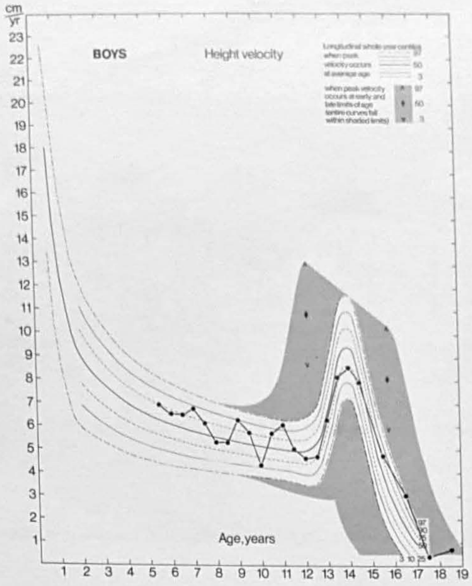
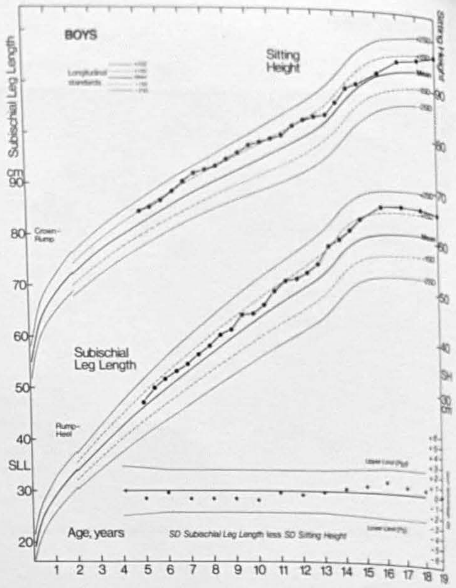
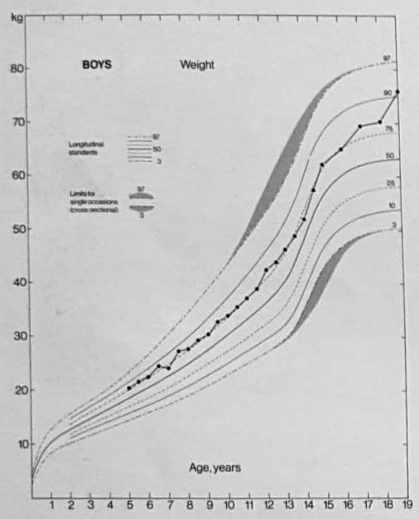
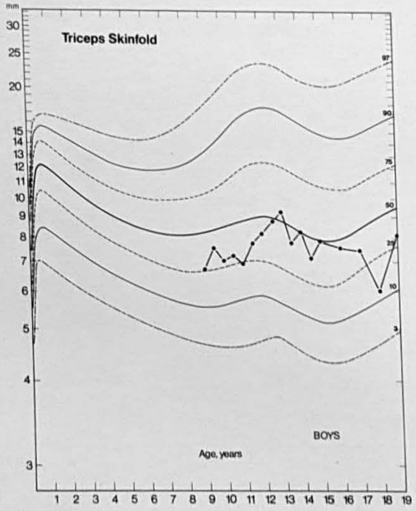
Age, years

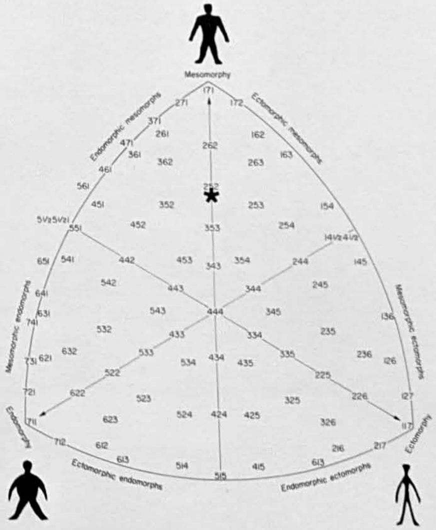


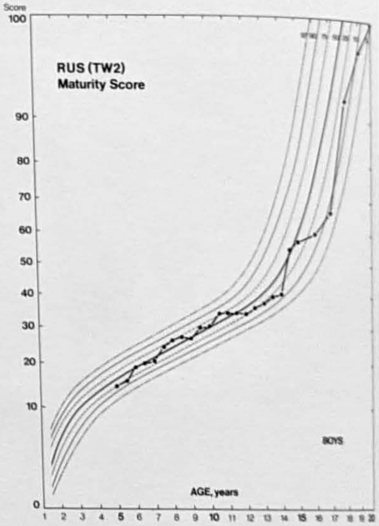


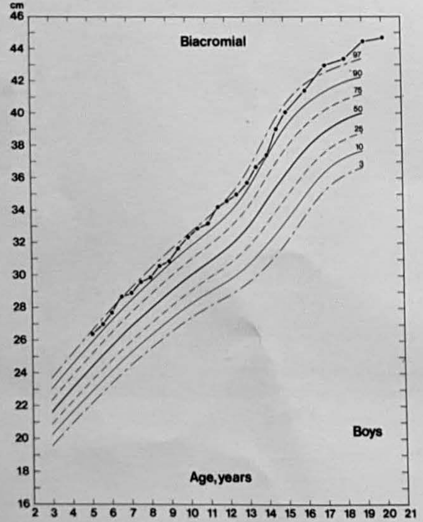


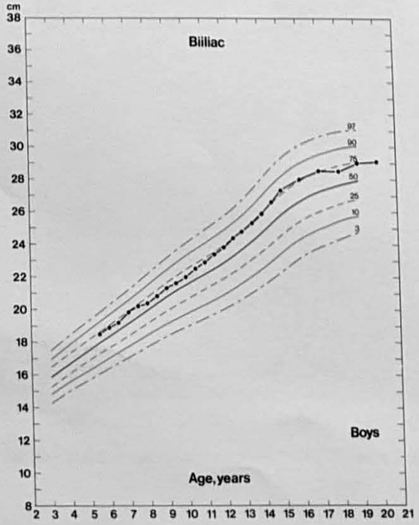












Normal Boy

Subject No. 3

A large boy with height mostly at the 75th centile but rising to the 90th near the end of the adolescent growth spurt. Height velocity peaks at exactly the average age. Although the peak is only at the 25th the velocity drops less sharply than most, so that 2·5 years afterwards it is at the 90th. Thus the total contribution of the spurt is slightly above average.

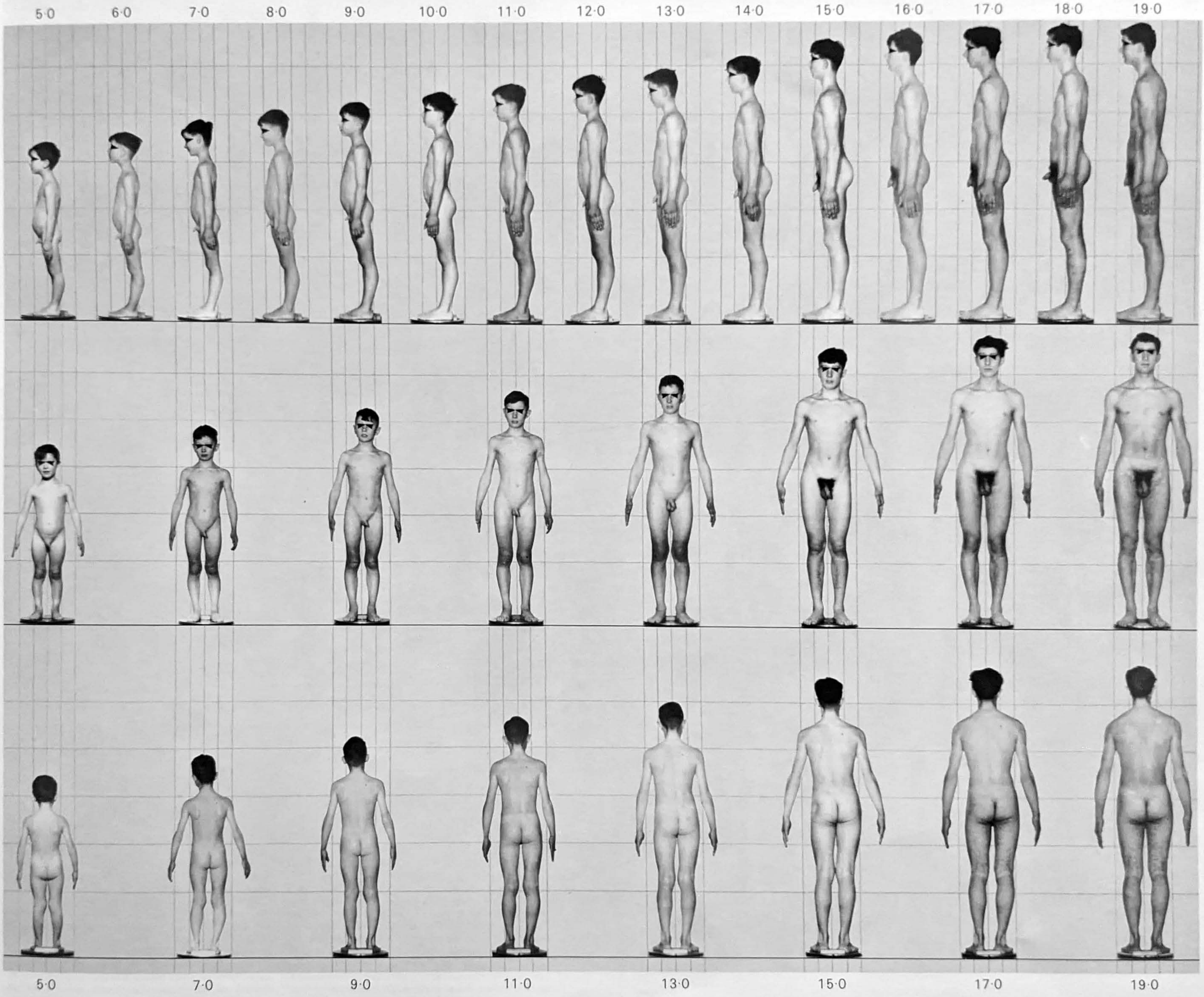
Sitting height and leg length are in average proportion. The earlier spurt of leg length creates a phase of long-leggedness at 15 and 16, but by 19 sitting height and leg length are both at +1 SD, approximately the 70th centile.

Biacromial diameter, always very large as befits this somatotype, shows the same prolonged spurt as height, which carries it to beyond the 97th centile. Biiliac diameter, in contrast, ends where it started, at the 75th.

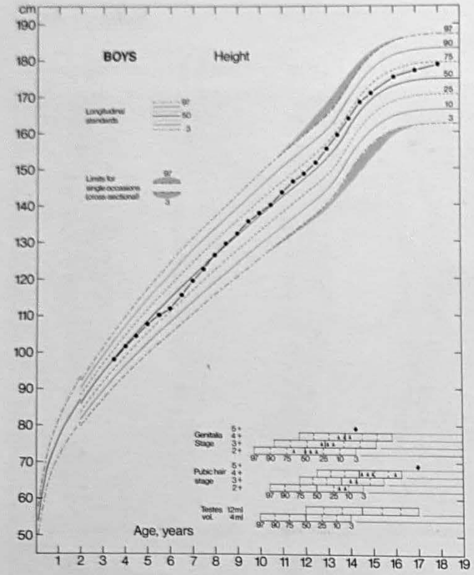
Weight is consistently 75th centile except for a sudden rise between 18 and 19, and triceps skinfold lies between the 25th and 50th centiles.

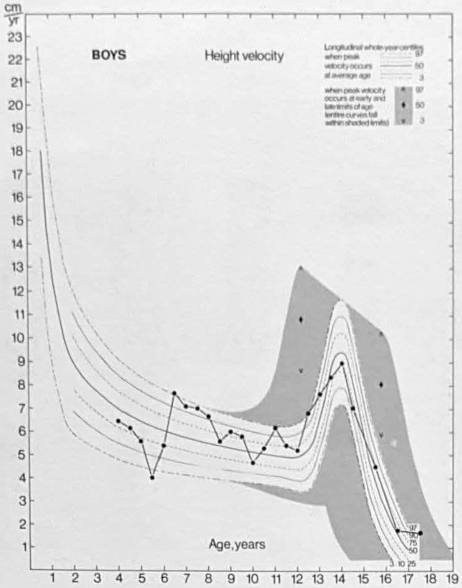
Bone maturity score lies between the 25th and 50th centiles till age 15. The development of the bones then hangs fire somewhat, this permitting (or being associated with) the prolonged period of growth in late puberty. Genitalia development is somewhat early, but pubic hair starts developing later than average and then develops unusually fast.

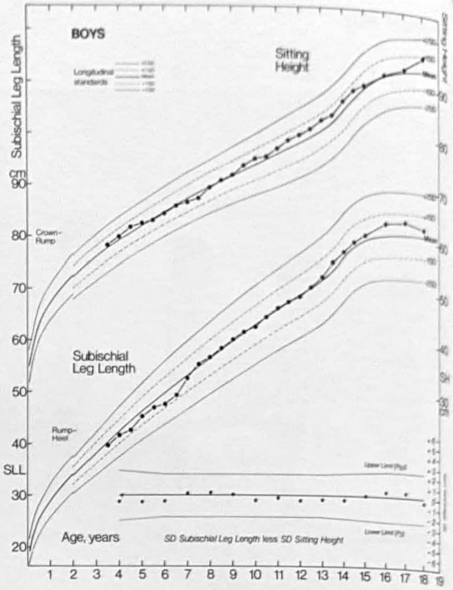
The pictures show a considerable asymmetry developing during childhood, with the right leg longer than the left. This is particularly marked at age 15 but by 19 it has almost entirely disappeared. We do not know whether such a spontaneous correction commonly occurs.

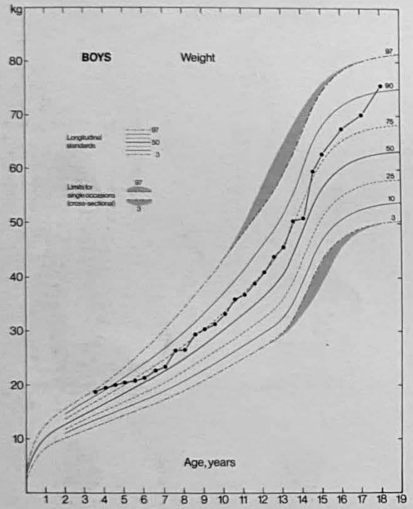


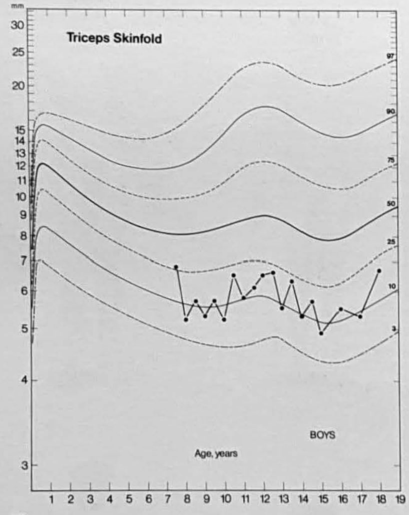
A large, highly mesomorphic boy, somatotype 2½5½2½.

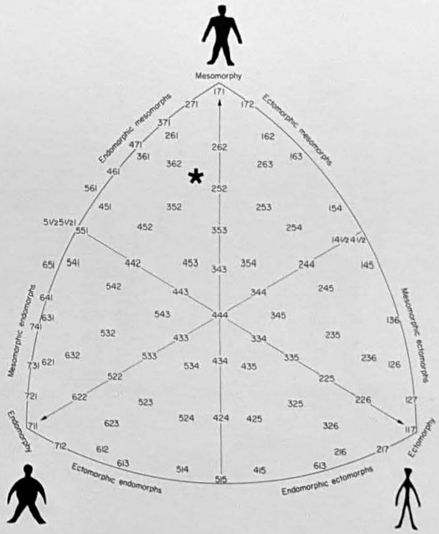


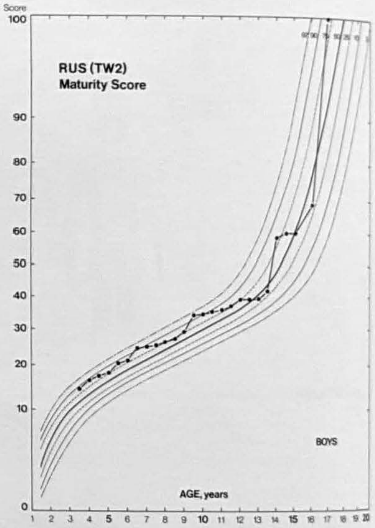


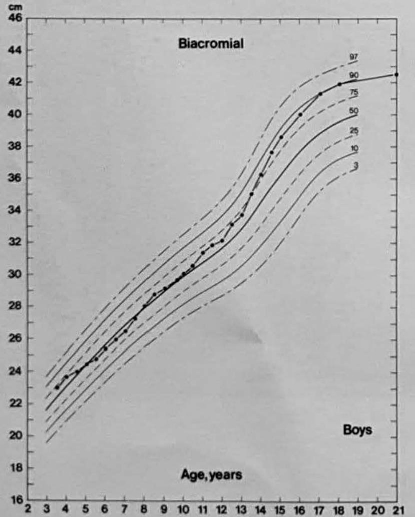


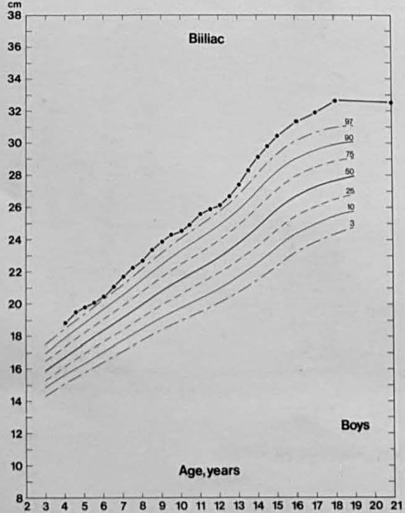












Normal Boy *Subject No. 4*

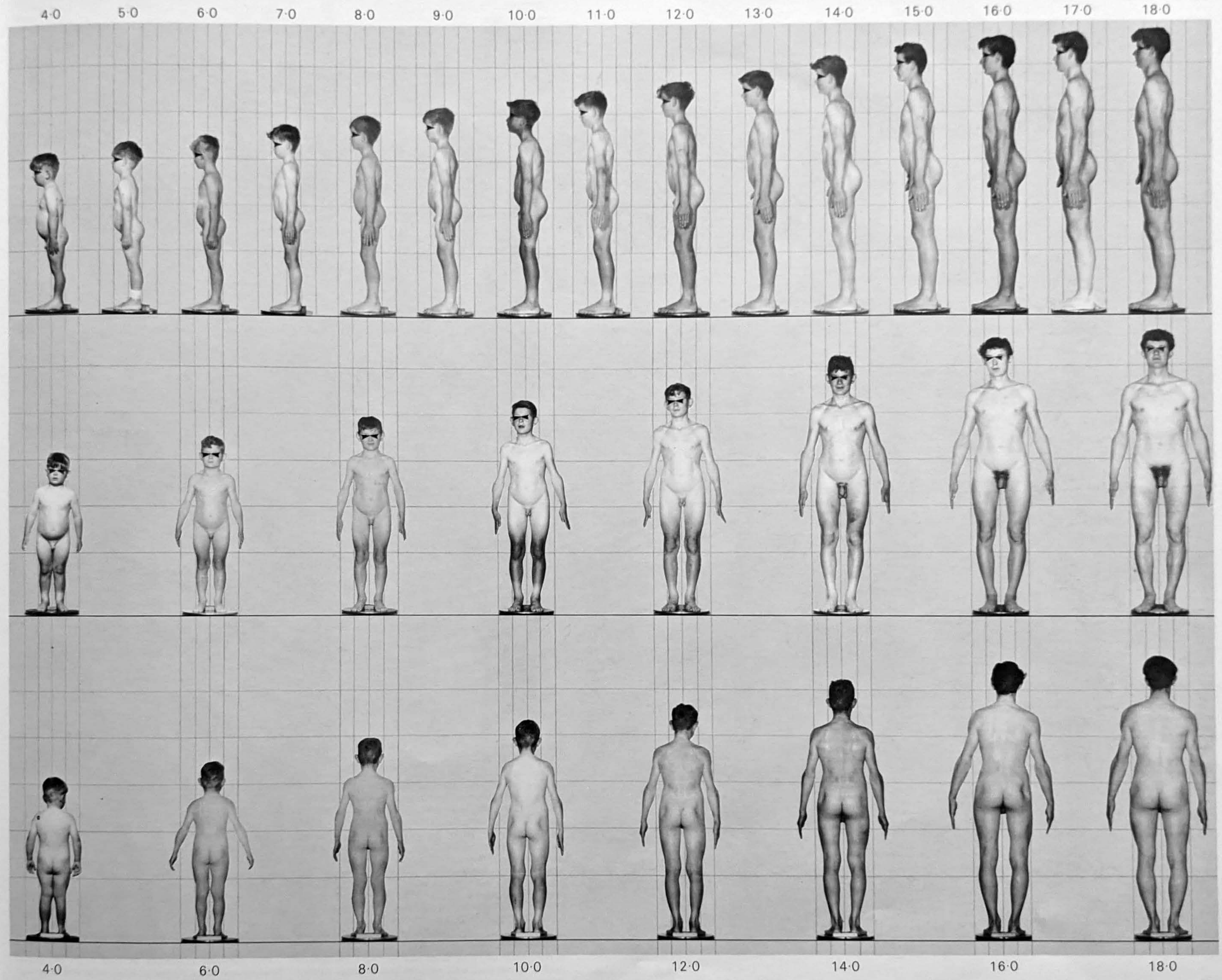
A boy whose height rises from the 50th centile to the 75th at puberty. From 3·5 to 6 years height velocity is low, with a particular check (of unknown cause) from 5 to 6. By age 6 height has fallen to the 25th centile. There is then a small catch-up, with velocity gradually reducing from the 97th to the 50th as height attained rises from the 25th to the 50th centile once more. Peak height velocity is at the average time, and nearly the average level.

The catch-up from age 6 to 8 is shown much better in the legs than in sitting height. From 8 onwards both measurements are near average, though sitting height increases surprisingly from 17 to 18. An additional measurement at age 22 shows that this is not measurement error. It is probably partly due to increased fat over the buttocks (see the sudden weight increase) which, if marked, may affect the sitting height.

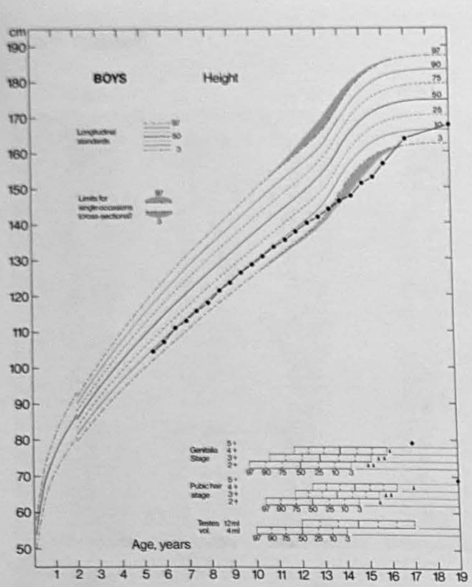
The biacromial diameter increases all the way from the 50th to the 90th centile during the spurt and biiliac diameter also increases considerably.

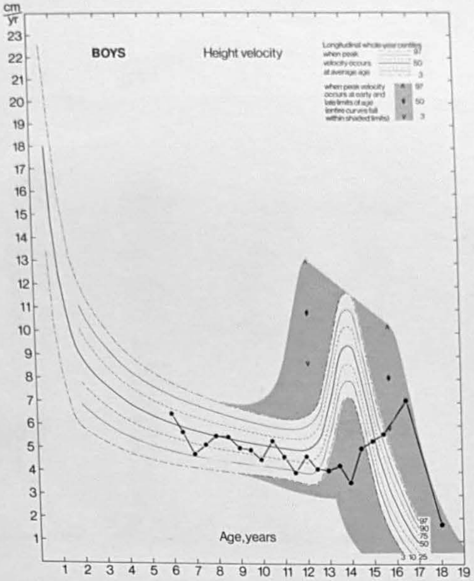
Bone maturity is a little ahead of average and closure of the epiphyses (i.e. final bone score 100) occurs early, in sharp contrast to subject no. 3. Genitalia develop at the average time, but pubic hair is later than average.

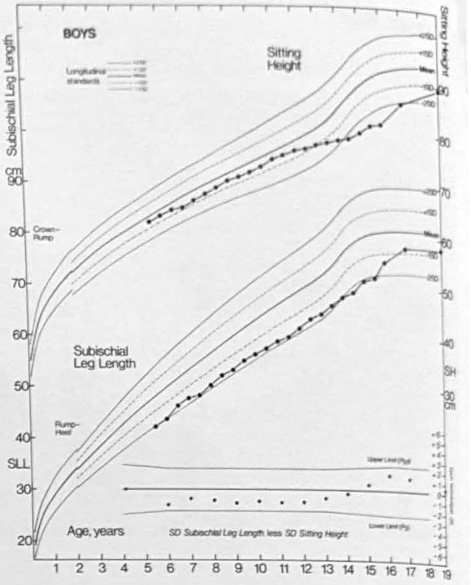
This boy, despite being high in mesomorphy, has unusually wide hips, with a biiliac diameter above the 97th centile from age 3·8 onwards. This is not due to fat, as can be seen from the skinfold, as well as from the pictures. The bow legs are presumably a consequence of the unusual pelvis. There is a marked seasonal effect seen in the skinfold, with a drop in the 6 months ending in June and a gain in the 6 months ending in December.

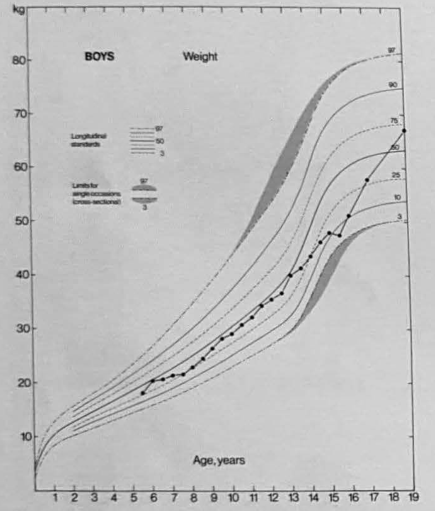


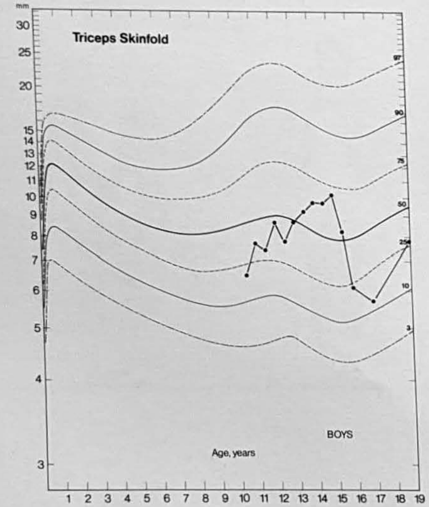
A highly mesomorphic boy, somatotype 2½5½2.

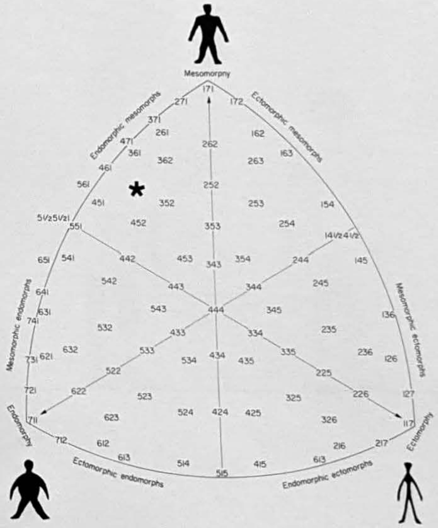


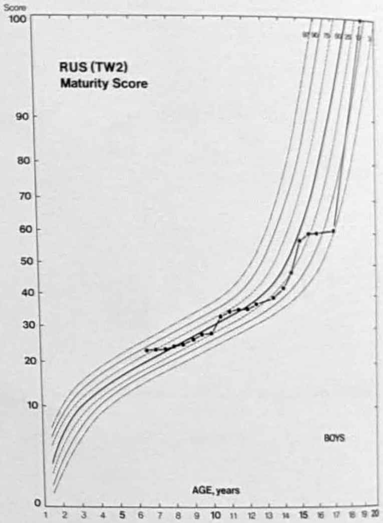


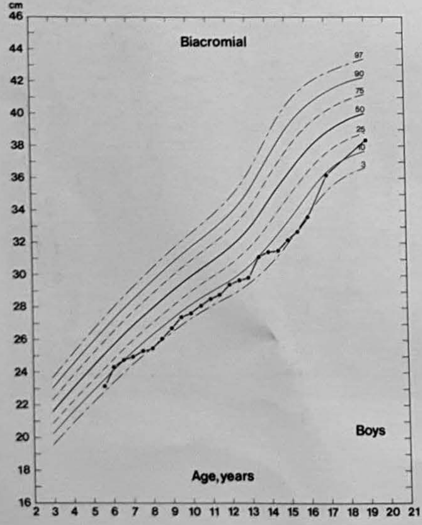


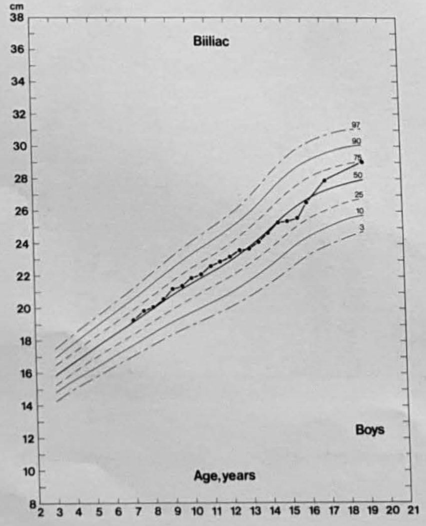












Normal Boy

Subject No. 5

Another highly mesomorphic boy, somatotype 3½5½1½, but small and a very late maturer. His height remains at the 10th centile from 5·5 to 11, being maintained this way by a velocity averaging the 25th centile. From 11 onwards his height gradually falls through the centiles because of the delay in growth. Height velocity goes down to 3·5 cm/year, which is about the lowest whole-year value that occurs in healthy boys. By the time the adolescent growth spurt starts, at 14·5 (see height velocity chart) this subject is actually outside the conventional limits of normal for height and qualifies as a patient with the diagnosis small/delay. Peak height velocity is not reached till 16·5 years (i.e. 2·5 SD late) but the spurt ultimately results in recovery to the original centile, as is usual in growth delay.

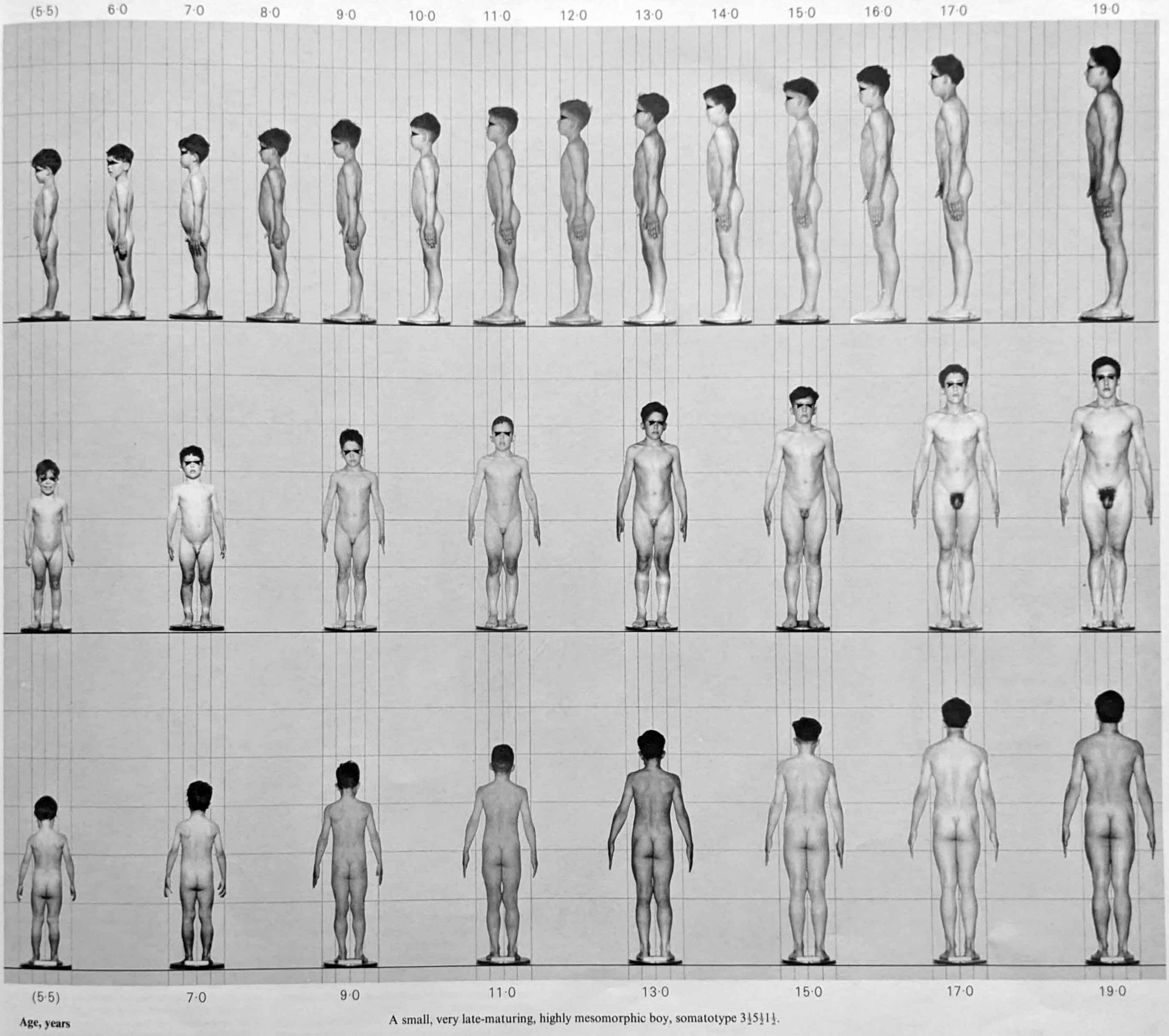
The relation of sitting height and leg length undergoes a marked change associated with the growth delay. At first sitting height is relatively greater (SD difference is about −1·0). Then from 12 to 16 the legs continue growing fairly well, while the trunk slows down more sharply; the SD difference rises, becomes positive (legs longer) and reaches a peak at 16, after which it falls back towards zero. However, at maturity the legs are considerably longer than one would have predicted from the proportion at age 6 (SD difference +0·5 finally, as contrasted to −1·5 initially). This type of growth occurs often in late maturers.

Biacromial diameter is smaller than usual for this somatotype and biiliac diameter is relatively greater. There is a sharp loss of limb fat (triceps skinfold) when the spurt gets under way, a not unusual occurrence in boys.

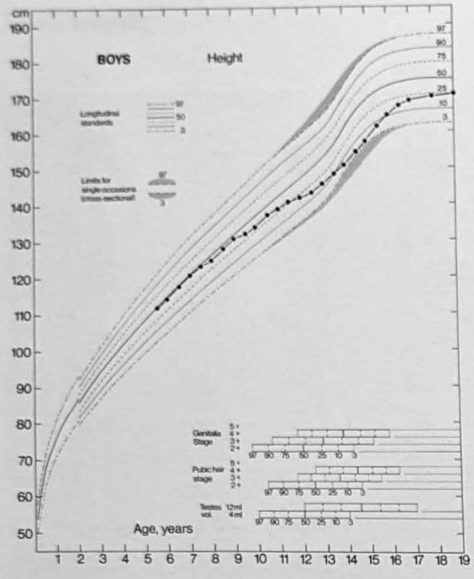
Bone maturity lies between the 25th and 75th centiles before puberty but from 15 to 17 falls to the 3rd.

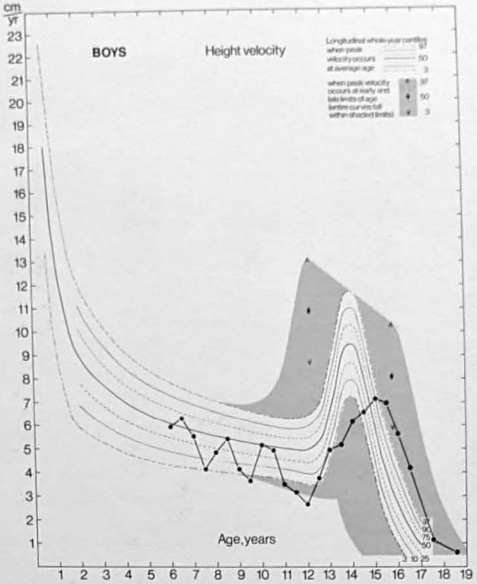
Genitalia and pubic hair also develop later than the limits of normal, in approximate agreement with peak height velocity.

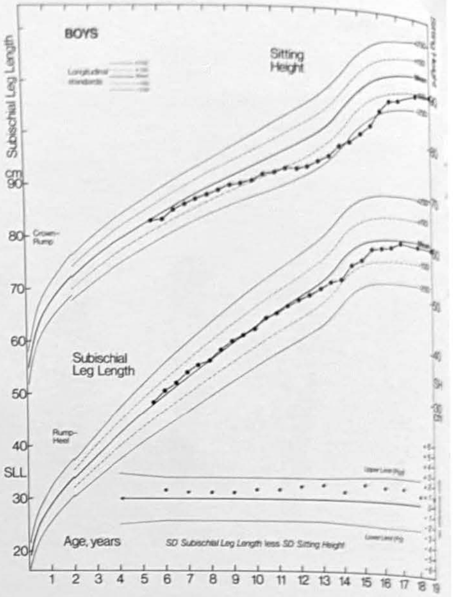
It is interesting to consider the adult height predictions from successive ages. The actual adult height is 167 cm. The prediction from age 6 was 168 cm; from age 10, 165 cm; from age 12, 165 cm; from age 14, 166 cm; and from age 16, 166 cm. The prediction equation successfully allows for the late puberty.

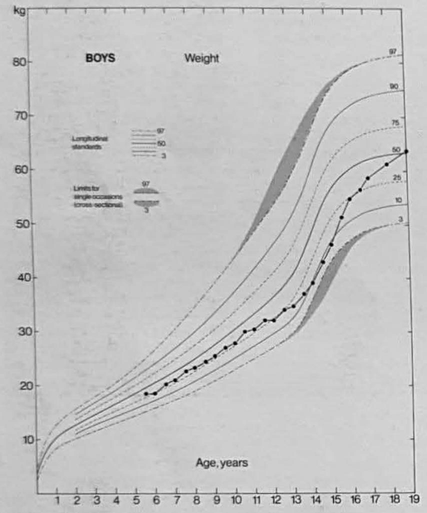


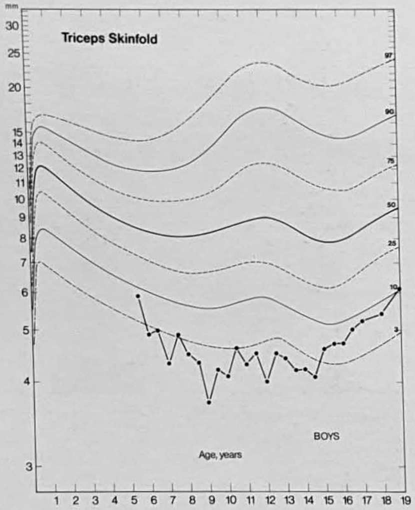
A small, very late-maturing, highly mesomorphic boy, somatotype 3½5½1½.

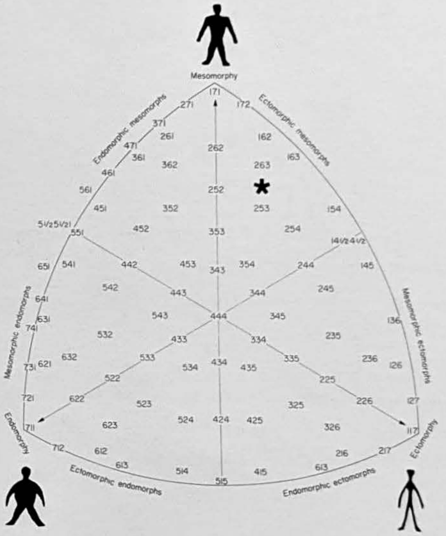


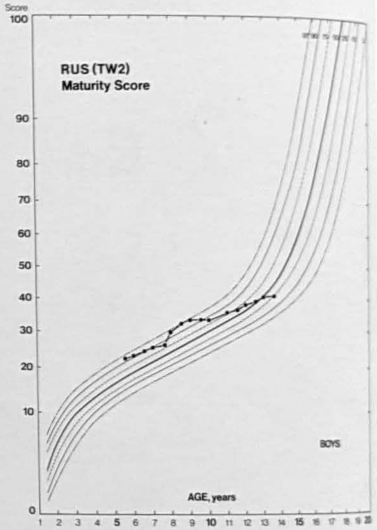


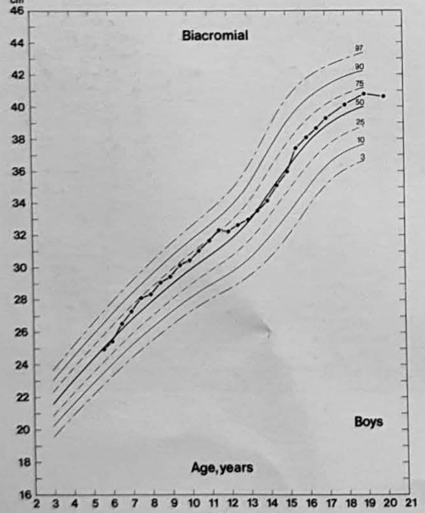


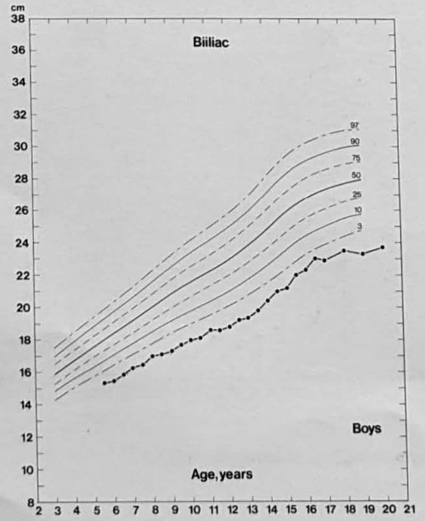












Normal Boy

Subject No. 6

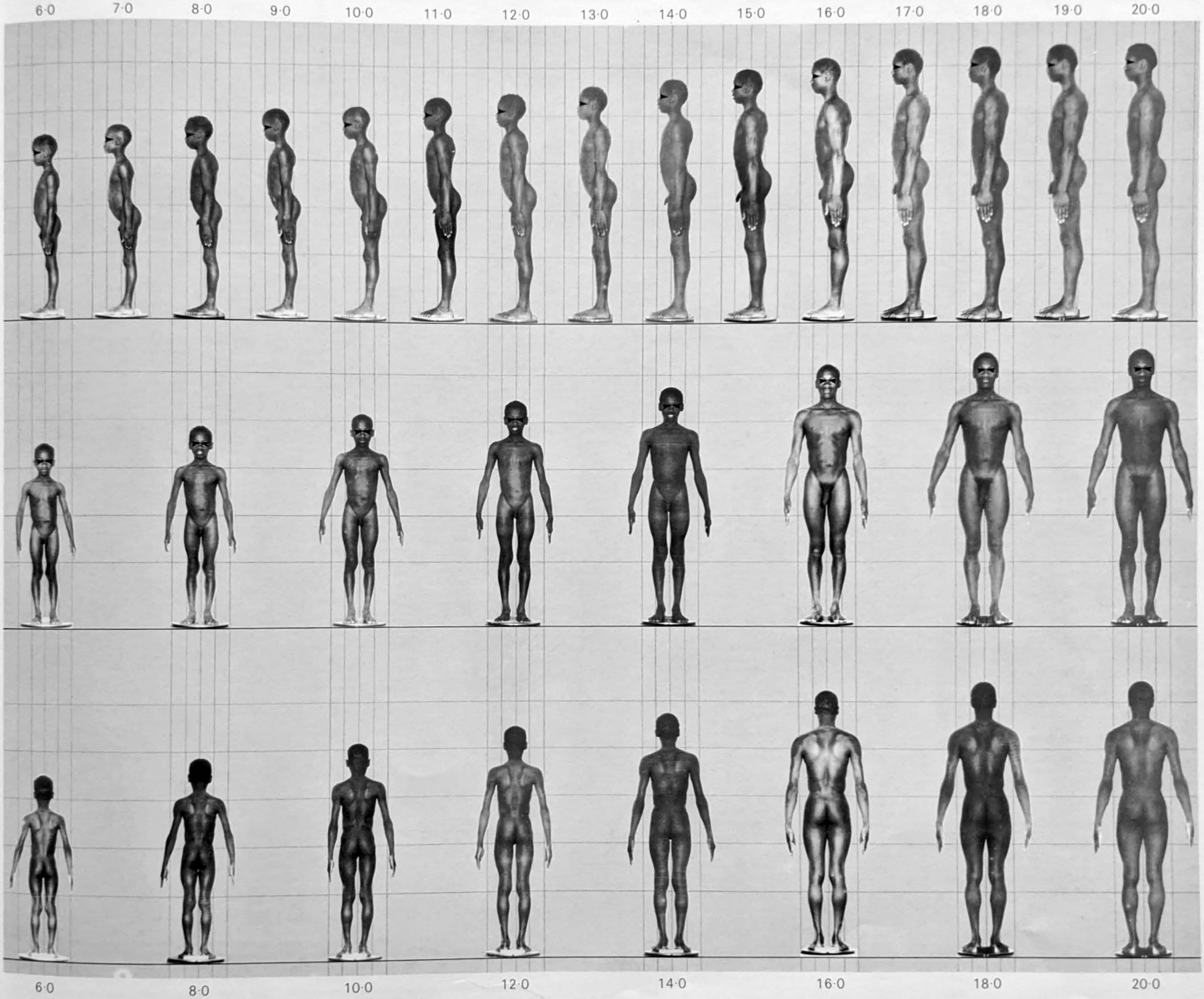
This boy, somatotype 25½3, has the long legs, slender hips and low limb skinfolds characteristic of Africans (see Eveleth and Tanner, 1976). At first he shows a lordosis which is also not uncommon in this population; it is presumably associated with the relative proportion of legs and trunk. However, as the trunk undergoes its growth spurt at puberty the lordosis largely disappears and the posture at age 20 is very good (this without treatment).

Height gradually falls from the 50th to the 5th centile, with a velocity averaging about the 15th both before and during the height spurt, except for the year immediately before the spurt, when it falls to 3·0 cm/year, even lower than in the previous subject. The height spurt is a year later than average.

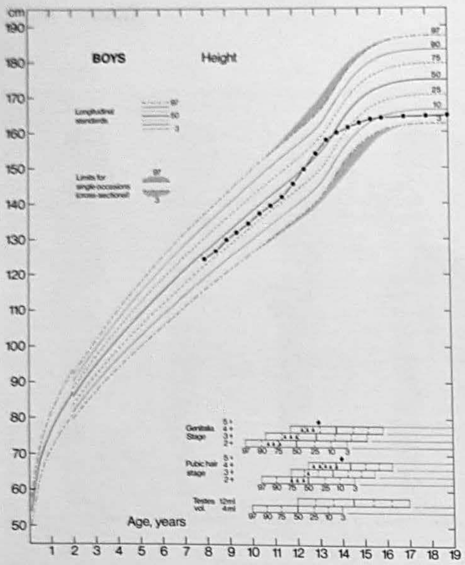
Leg length averages about 1 SD greater than sitting height throughout growth, peaking to 1·6 SD greater at age 15.

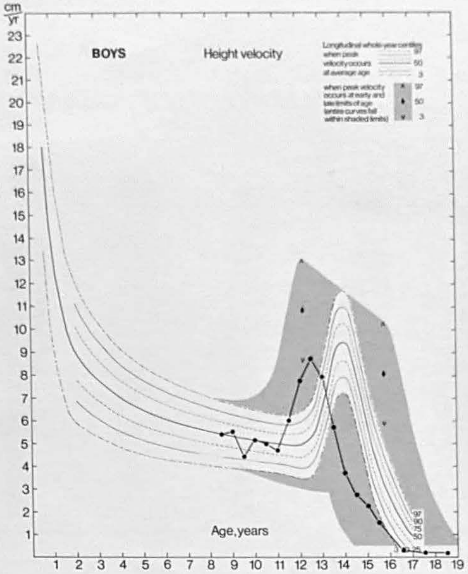
Biacromial diameter, as in nearly all mesomorphs, is proportionally greater than height, and biiliac diameter is very low, indeed below the 3rd centile on the European-derived charts. Triceps skinfold is also below the 3rd on the British charts most of the time.

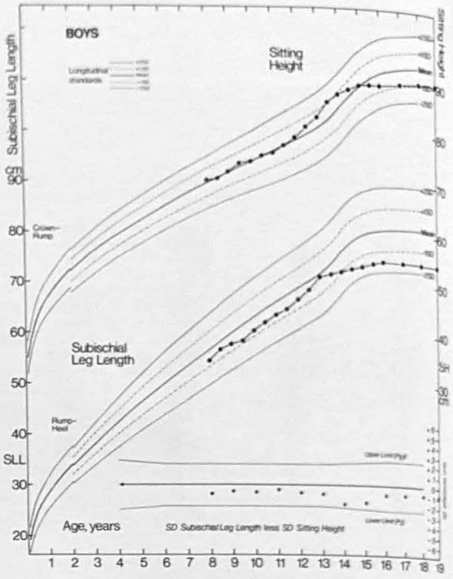
Bone maturity, at first advanced, falls to just below average. No ratings of genitalia or pubic hair are available.

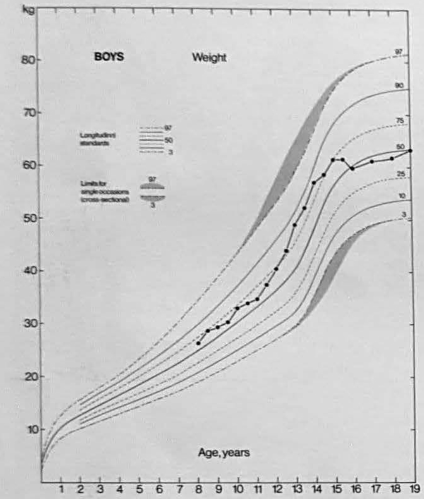


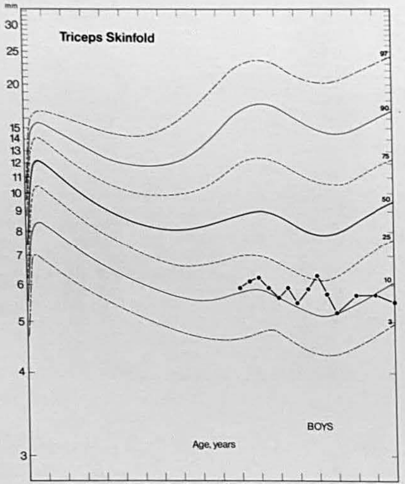
A highly mesomorphic boy of African parentage, somatotype 25½3.

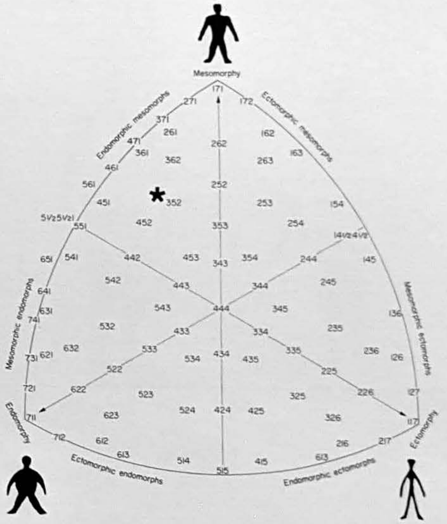


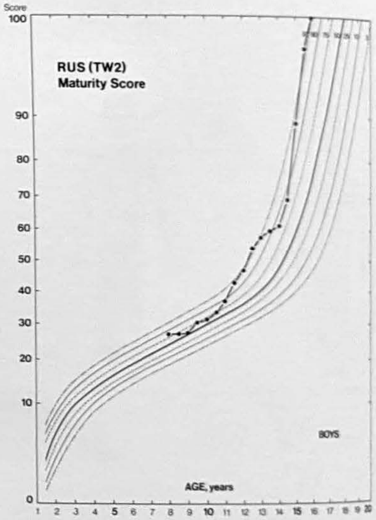


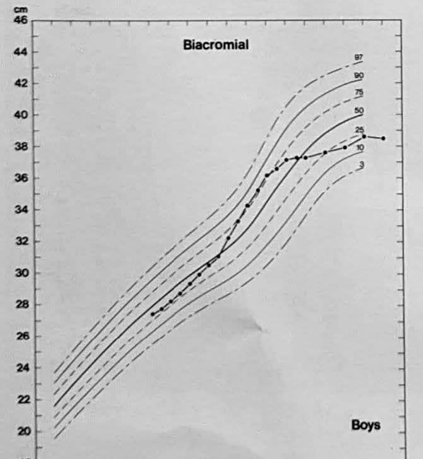


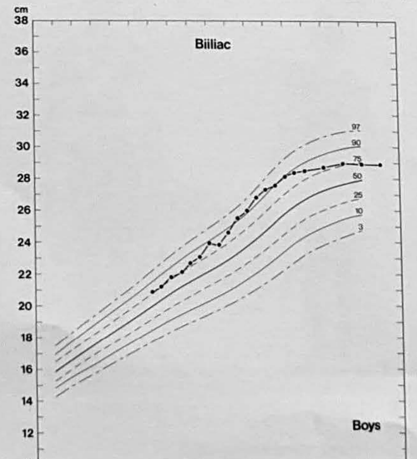












Normal Boy — *Subject No. 7*

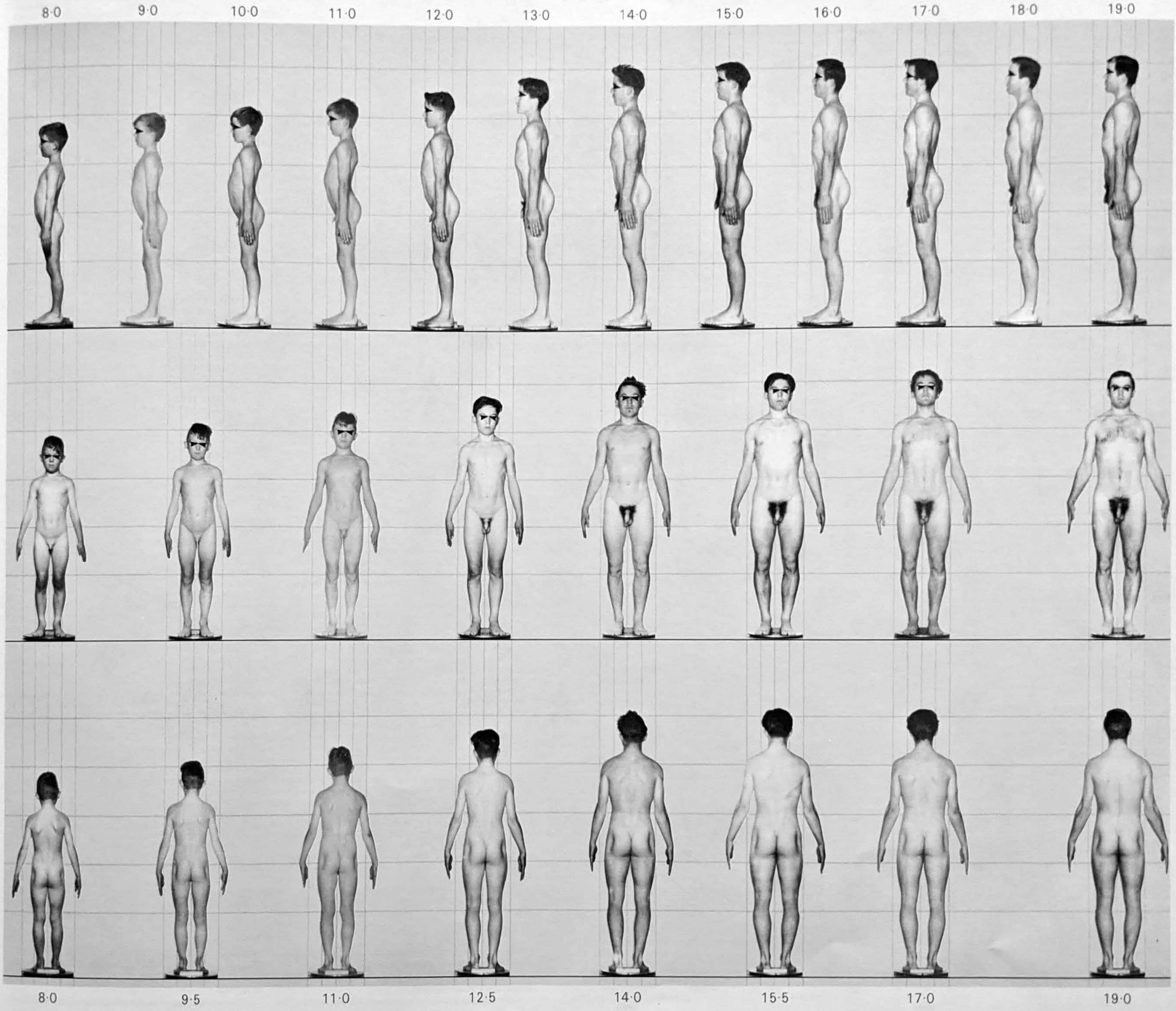
A boy whose height, at first at the 30th centile, rises temporarily to the 60th even in our longitudinal standards, due to a very early growth spurt. The peak velocity of the spurt, however, only reaches the 3rd centile for the age of peaking and the smallness of the spurt causes the mature height to be at the 5th centile. This degree of diminution from the prepubescent height centile (30th to 5th) is quite unusual.

Sitting height follows very much the same curve as height, passing from the 50th through the 70th to the 30th centile. Leg length however, has only a very small spurt. It is consistently some 0·8 SD less than sitting height except during the spurt when the difference increases to nearly 2 SD.

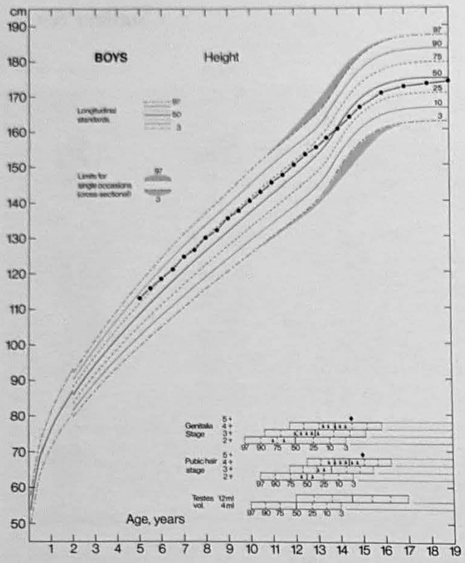
The biacromial diameter shows the same early rise as height, from the 30th to the 80th, with an eventual position at about the 25th. Biiliac diameter is large, passing from the 75th to above the 90th and returning eventually to the 75th.

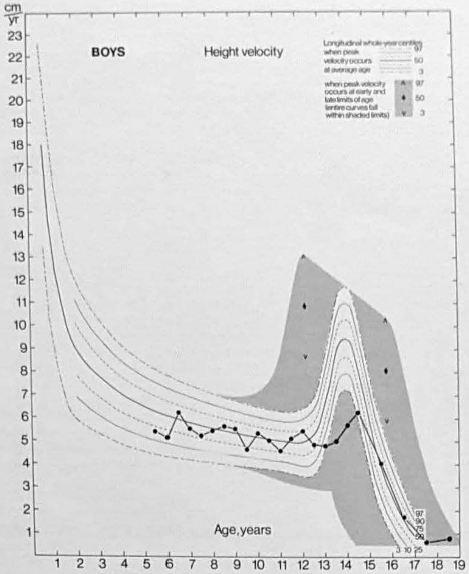
Bone maturity, initially around the 75th centile, increases rapidly in association with the early adolescence, remaining near the 97th centile thereafter, in agreement with the age of peak height velocity. Genitalia and pubic hair stages are reached at around the 80th centile.

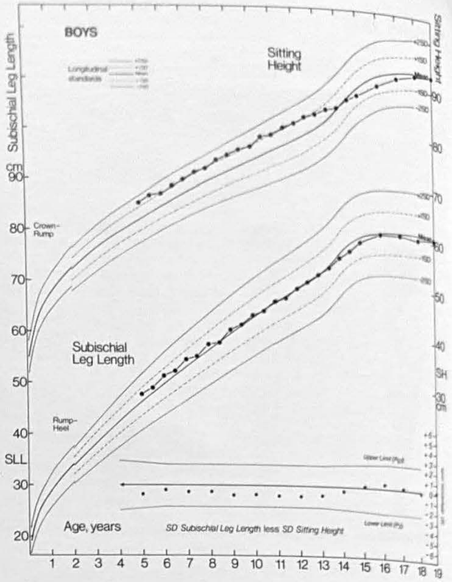
The pictures show a strongly mesomorphic physique with somewhat bow legs associated with the rather wide pelvis, as in the case of subject no. 4.

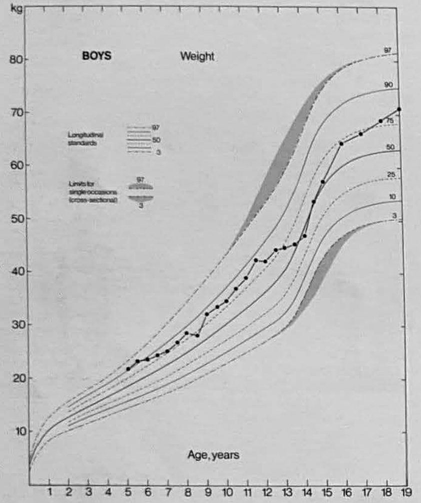


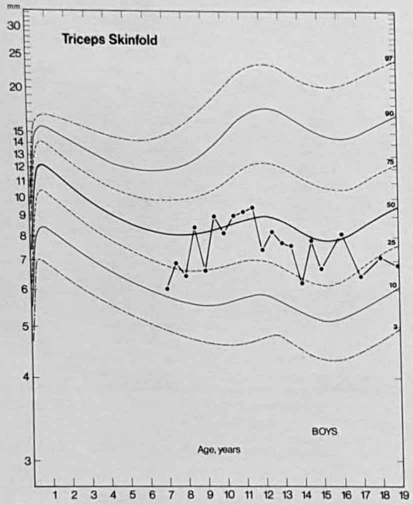
A small, early-maturing and highly mesomorphic boy, somatotype 3½5½2.

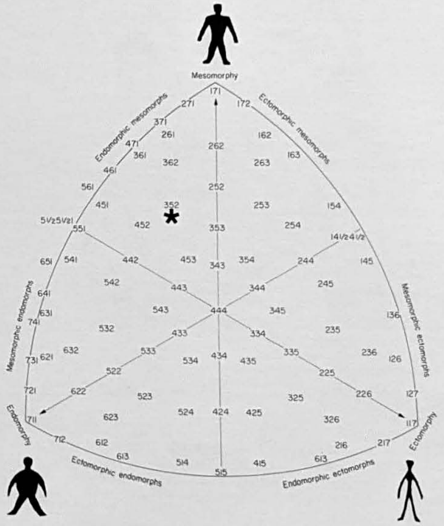


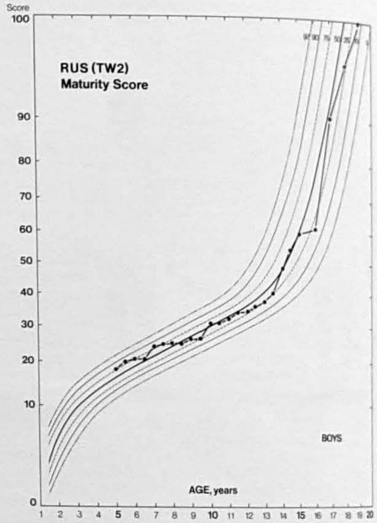


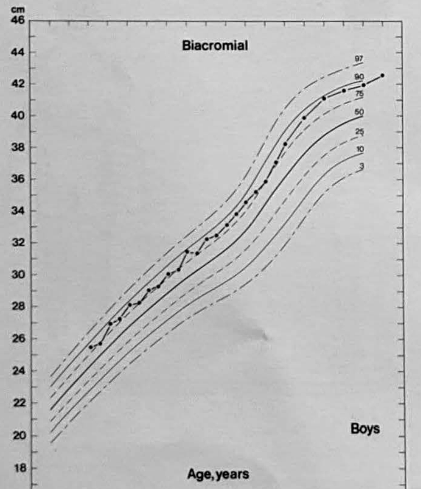


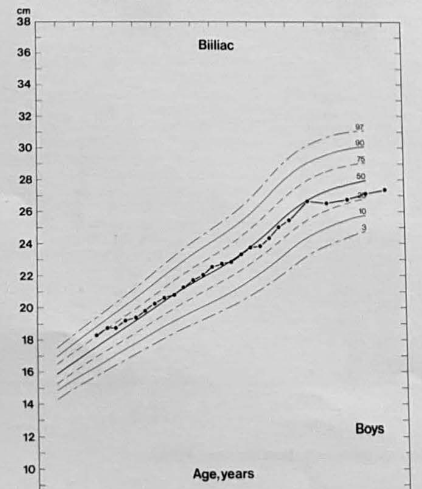












Normal Boy

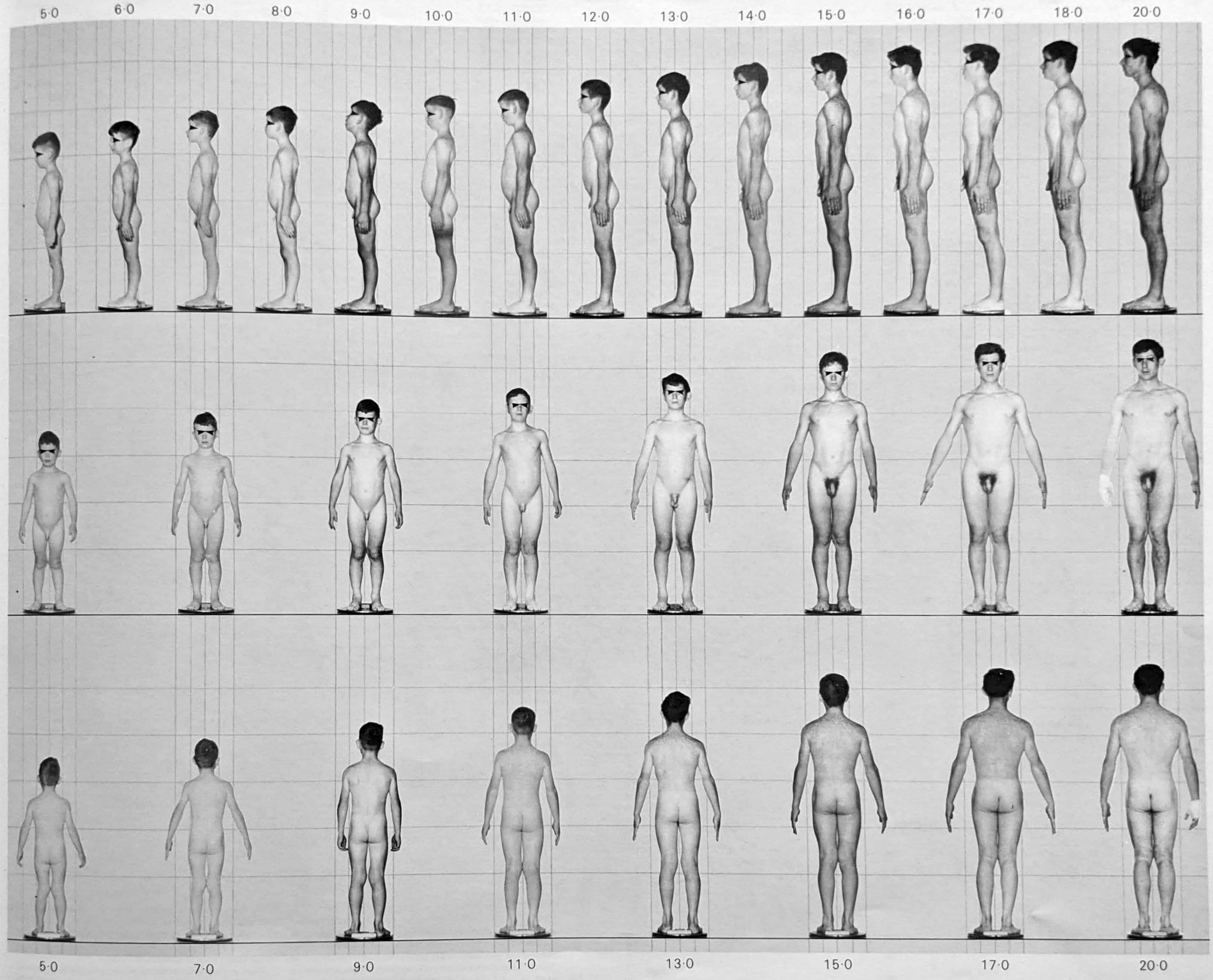
Subject No. 8

A boy of somatotype 352, whose growth spurt is abnormally small by conventional standards. His height is around the 75th centile initially, and falls only slightly (height velocity around the 45th centile) until the spurt.

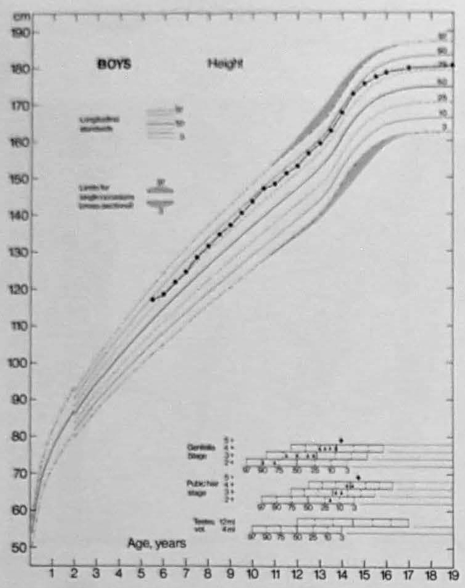
Bone maturity is average throughout and the height spurt takes place at about the average age. However, the peak is below the 3rd centile with the result that final height is about the 40th.

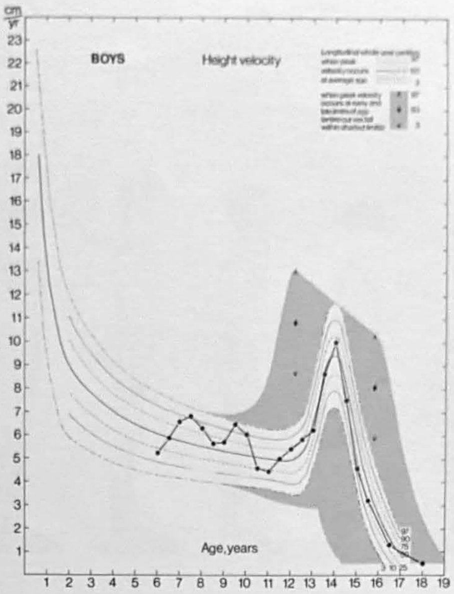
The small height spurt is due to an almost total absence of the usually large spurt in sitting height. Leg length has a spurt, although a small one. Sitting height ends at the 50th centile, having been initially at the 80th; leg length is rather consistently at the 50th.

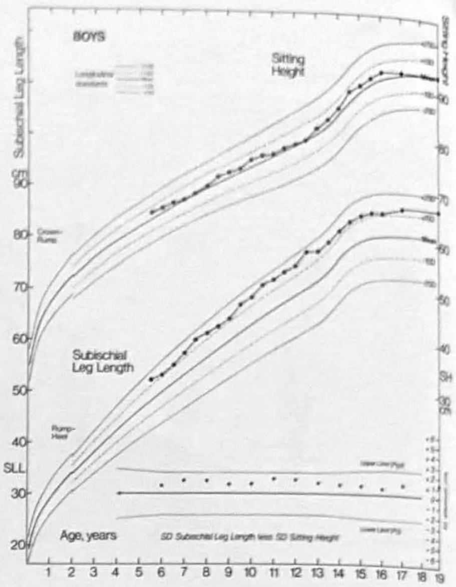
The absence of a spurt in sitting height is not due to lack of androgens, for the spurt in biacromial diameter is entirely adequate, the lowering of triceps skinfold occurs, and the growth of the genitalia and pubic hair is normal, with the various stages occurring at approximately the average times.

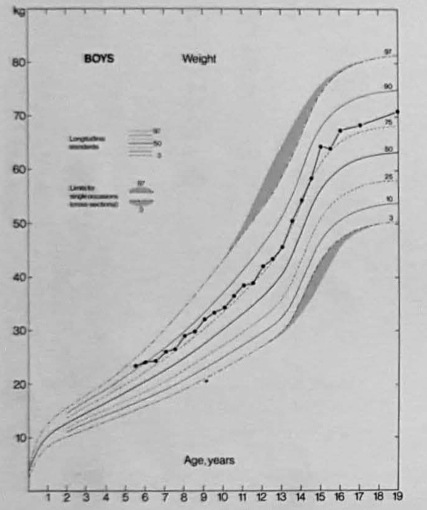


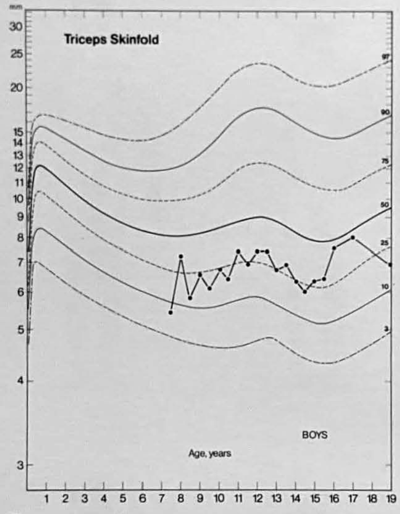
A rather mesomorphic boy, somatotype 352, with an unusually small growth spurt.

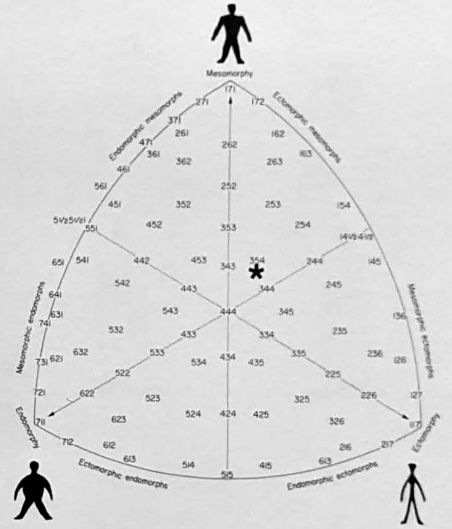


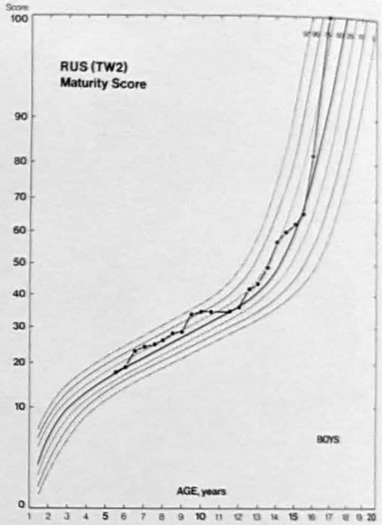


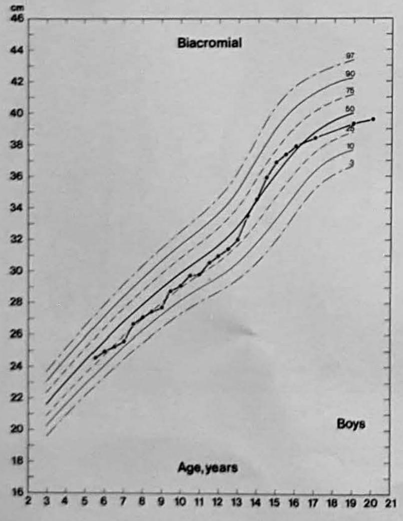


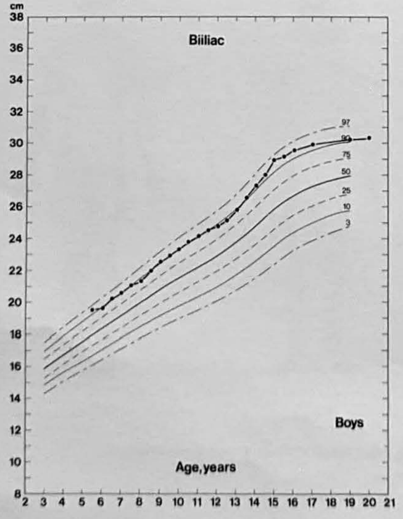










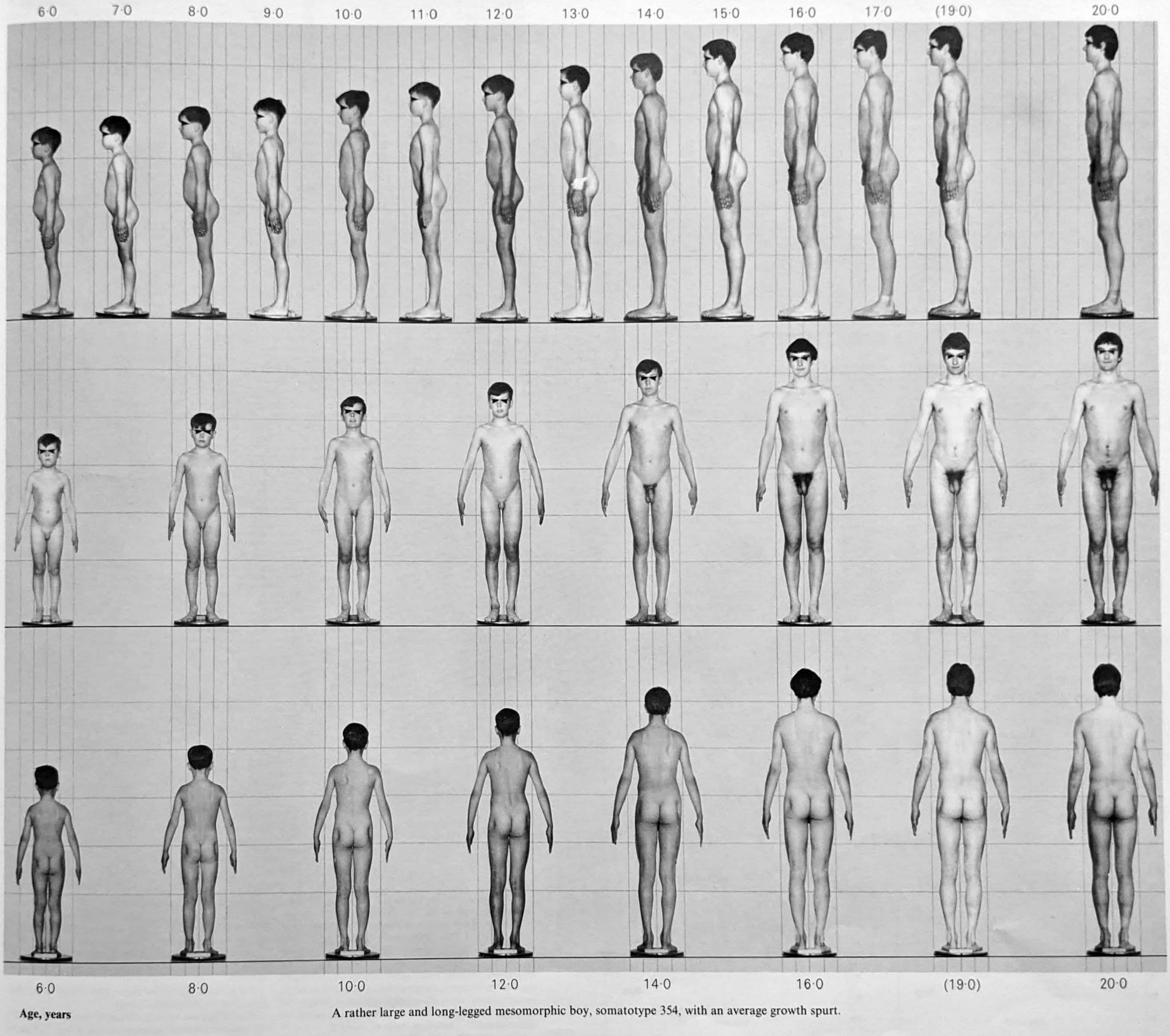


Normal Boy *Subject No. 9*

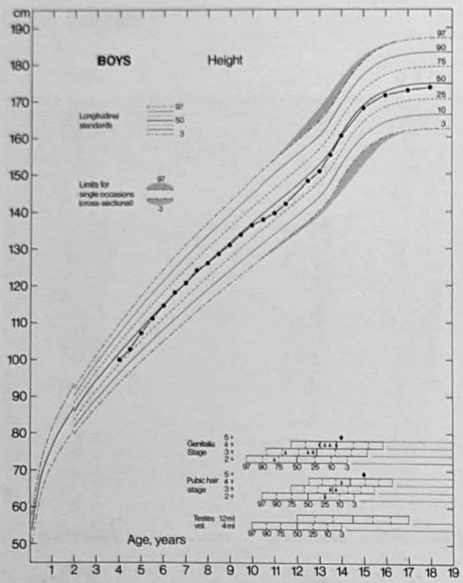
A larger than average, mesomorphic boy of somatotype 354. His height remained at about the 75th centile throughout growth despite rather wide fluctuations, of unknown origin, in his height velocity curve. The height spurt takes place at the average age and has a rather greater than average peak. The legs are long relative to the trunk, leg length being consistently at about +1·2 SD and sitting height only slightly above 0·0 SD.

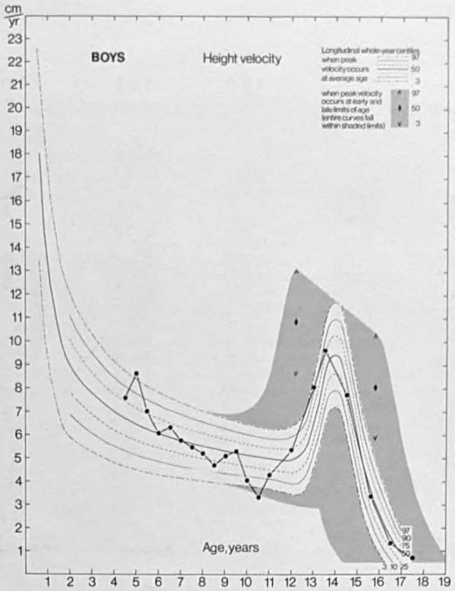
Biacromial diameter and biiliac diameter both seem to show spurts of above average magnitude, but this is an artefact due to our using cross-sectional standards. Biacromial starts at and returns to the 25th centile, and biiliac starts at and returns to the 90th. The triceps skinfold shows the usual loss during the spurt with a catch-up afterwards. The bone maturity is most of the time a little in advance of average.

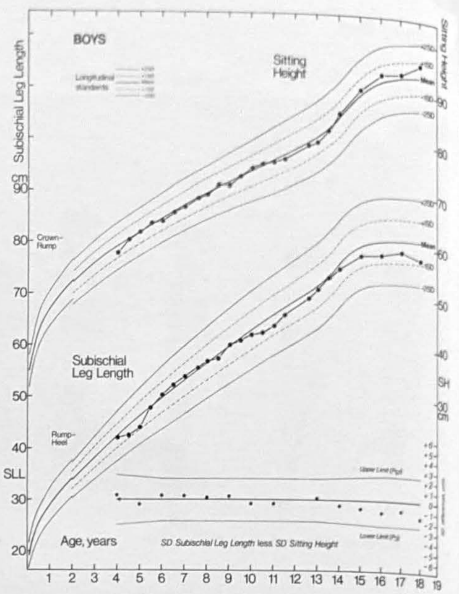
There is a marked discrepancy between genitalia and pubic hair timings. The genitalia are initially advanced, with successive stages at about the 80th, 75th and 35th, whereas pubic hair is slightly delayed with stages at the 25th, 40th and 50th.

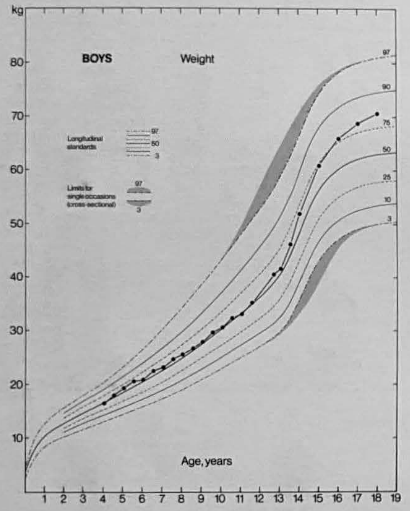


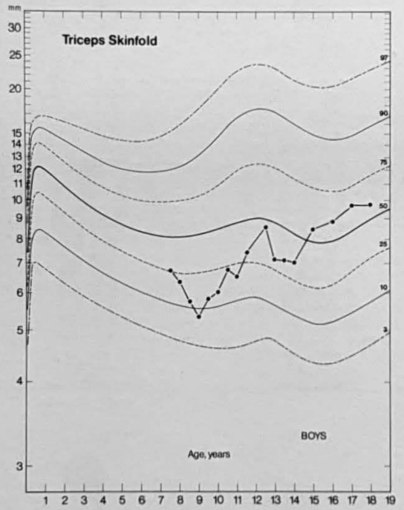
A rather large and long-legged mesomorphic boy, somatotype 354, with an average growth spurt.

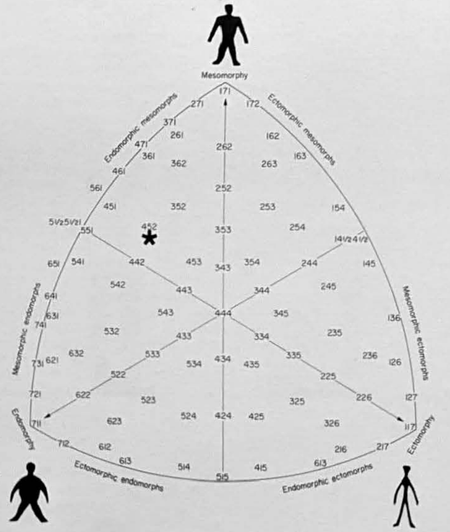


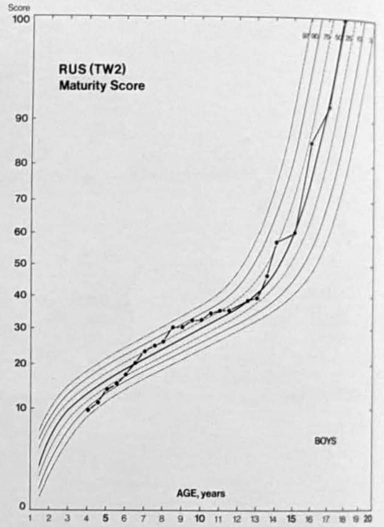


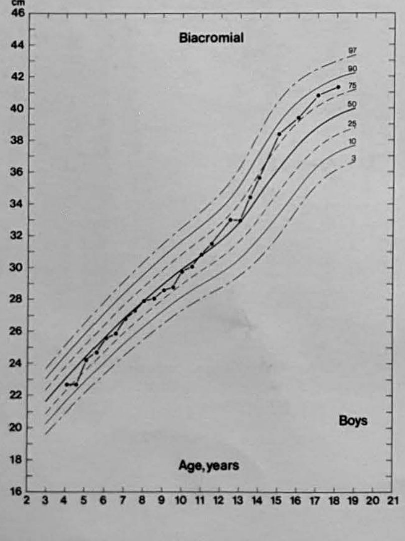


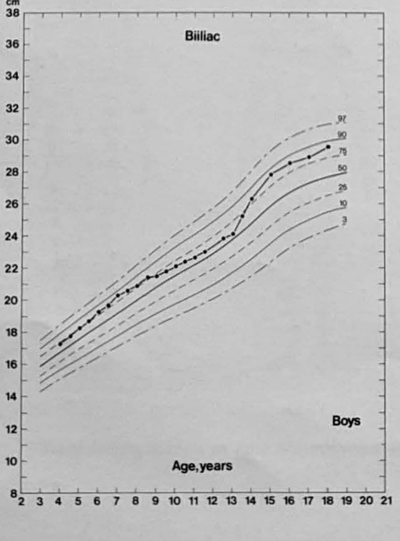












Normal Boy

Subject No. 10

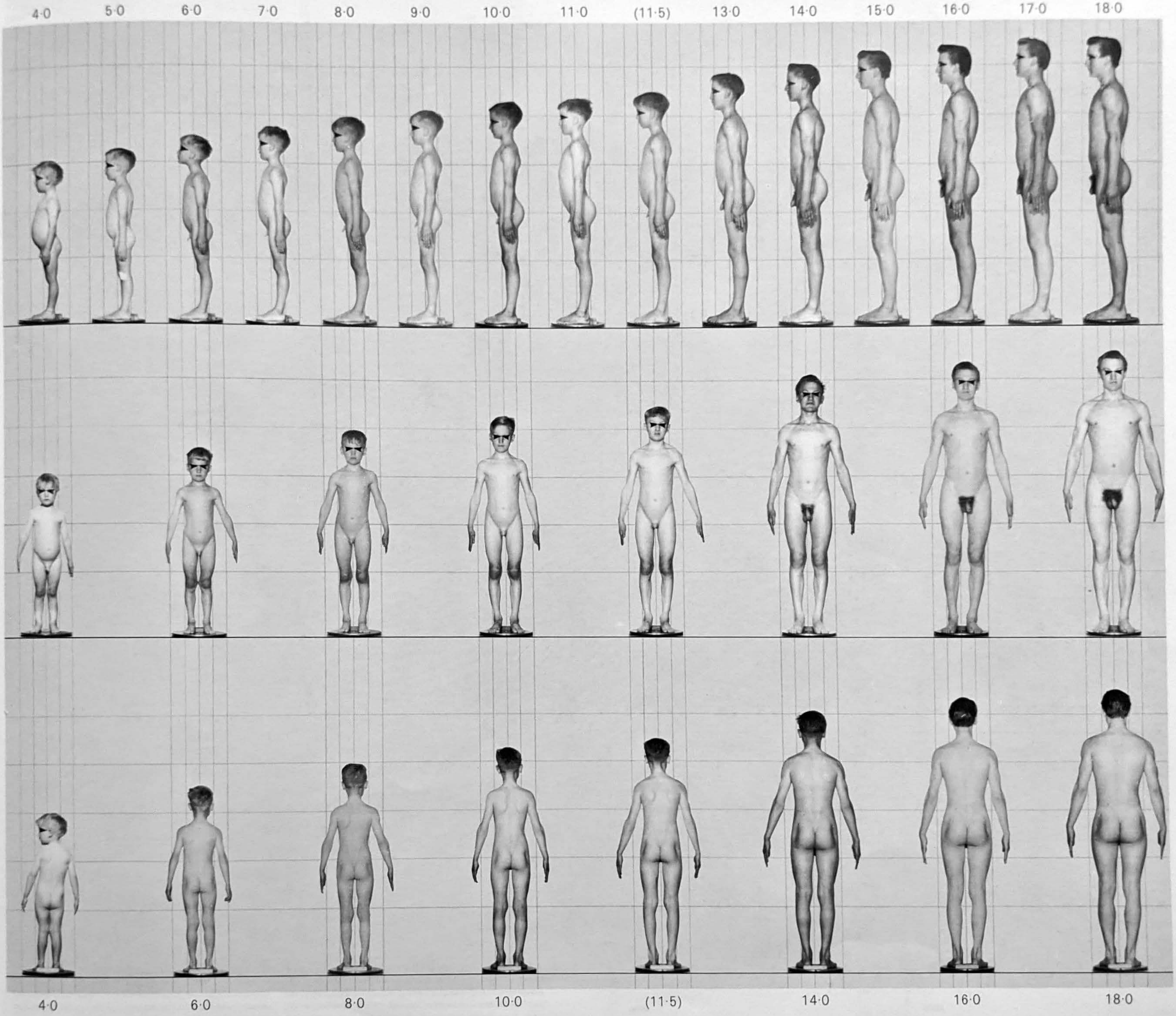
A mesomorphic boy, somatotype 452, whose height remains close to the 50th centile throughout growth. In the year following the first examination there is a rather high height velocity which may represent a small catch-up. Thereafter the height velocity falls in as steep a deceleration as is seen in normal boys to reach a nadir of 3·5 cm/year just before the spurt begins. The spurt itself is a little early and its peak reaches the 50th centile. Legs and trunk are both close to average length up until puberty, when sitting height rises above average, and leg length falls below it. Thus the difference between the SD scores diminishes from a little above zero to −1·5.

Biacromial and biiliac diameters undergo larger than average spurts rising from the 50th to the 80th and the 75th to 80th centiles respectively. Presumably this accounts for the rise of weight during the spurt from the 50th to the 80th, though the skinfolds also increase somewhat at this time.

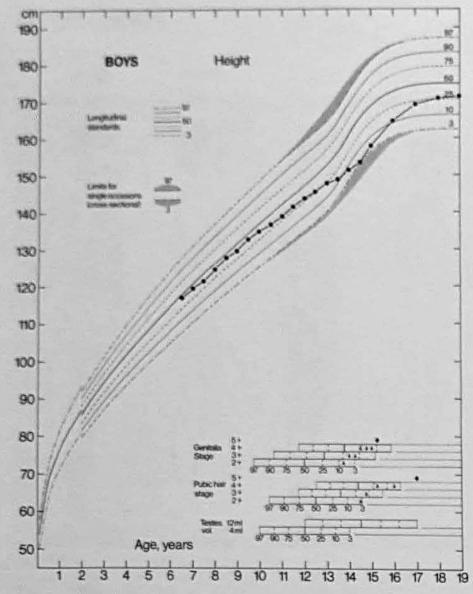
Bone maturity is at first delayed but advances rapidly to reach the 90th centile at age 8 and 9; after this it falls back to the 50th.

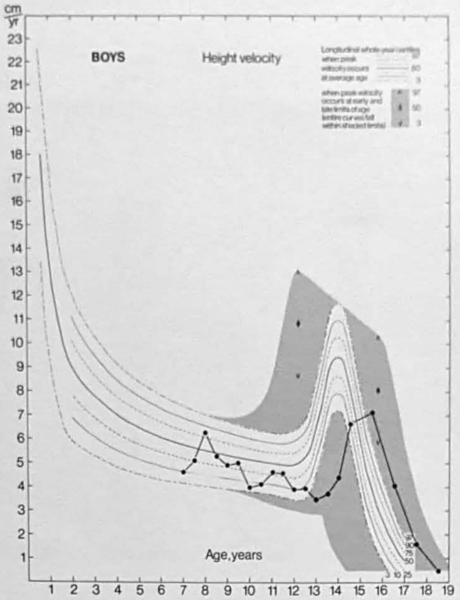
The genitalia stages occur earlier than average; pubic hair starts later but is thereafter average.

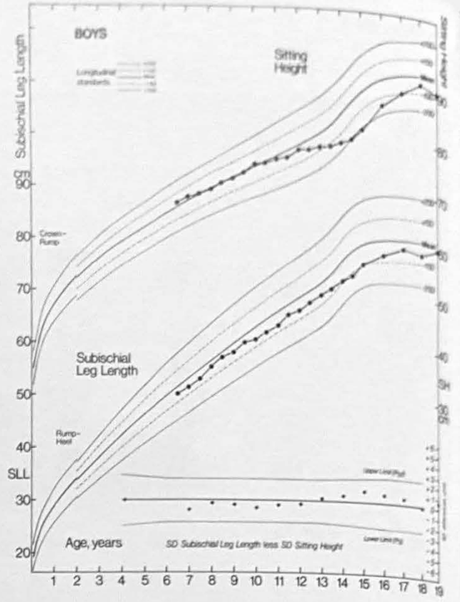
This subject was evidently difficult to measure for some of his biacromial diameter measurements (at 4·5 and 12·5 years, for example) seem to be as much as 0·6 cm out.

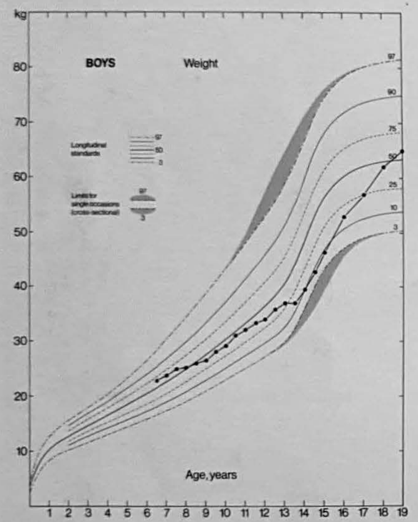


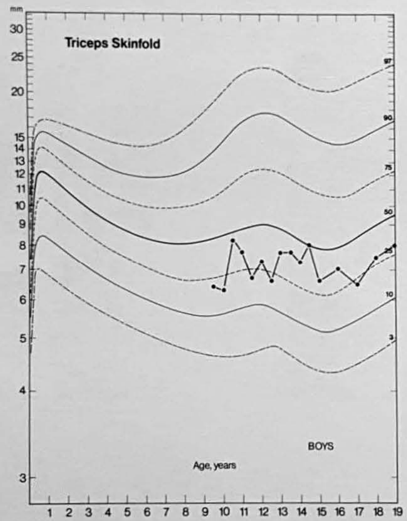
A fairly mesomorphic boy, somatotype 452, of average size and growth pattern.

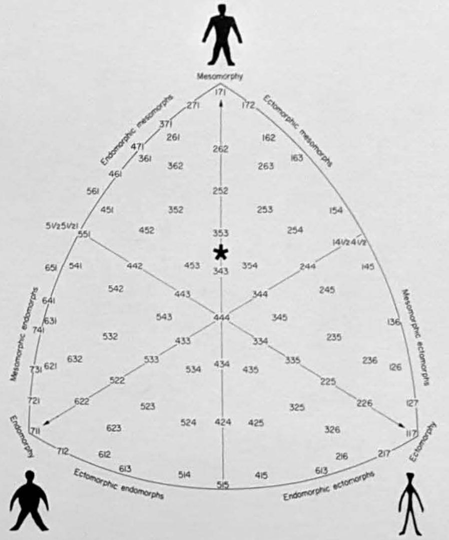


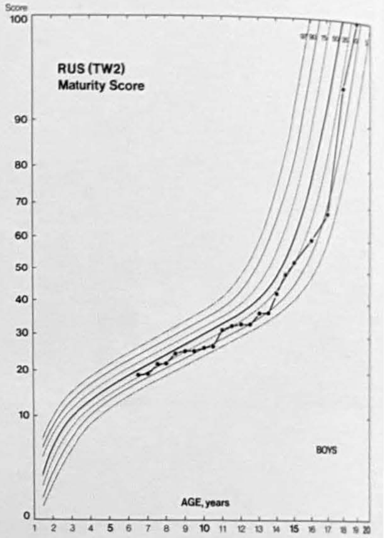


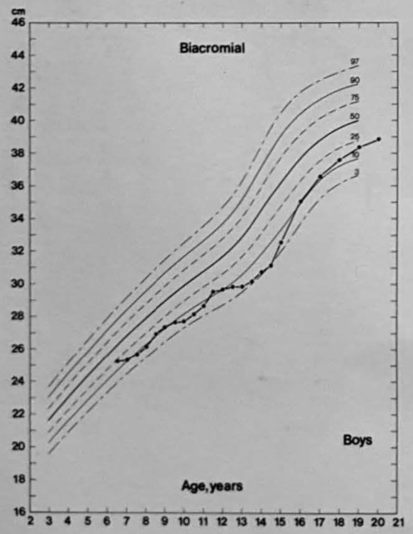


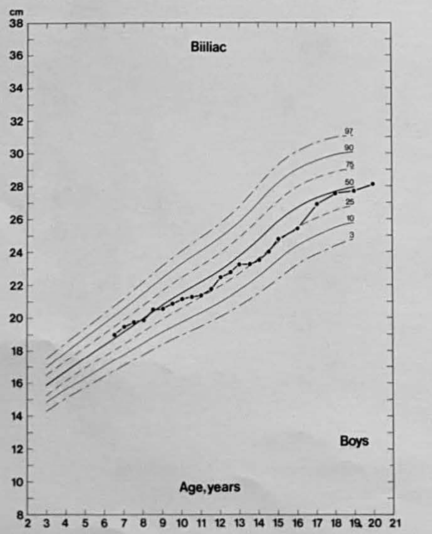












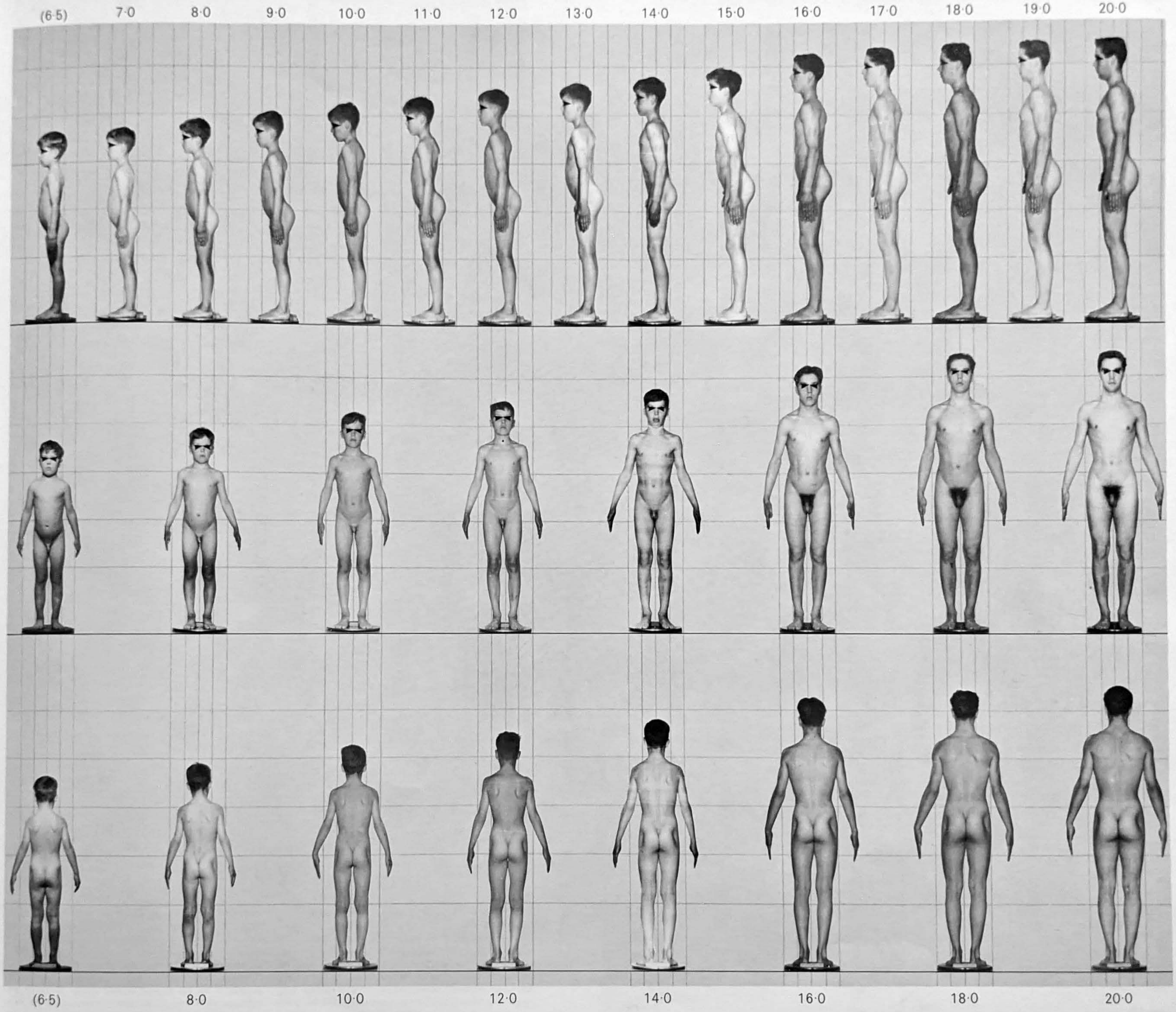
Normal Boy *Subject No. 11*

A predominantly mesomorphic boy, somatotype 34½3, with a rather late and small adolescent growth spurt. His height at first is near the 50th centile, then gradually falls till, due to the late adolescence, it touches the 3rd, before finishing at the 25th. Peak height velocity is at about the 25th centile and located nearly 2 SD late.

Sitting height follows a similar pattern to height, though with a proportionately larger spurt; leg length, on the contrary, has practically no spurt at all.

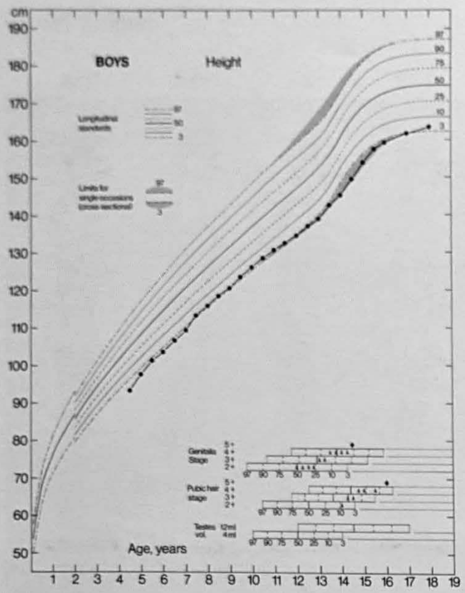
Biacromial and biiliac diameters show the same type of curve as height, the lines descending through the centiles till about age 15 and then climbing back to their original 25th and 50th centile positions respectively.

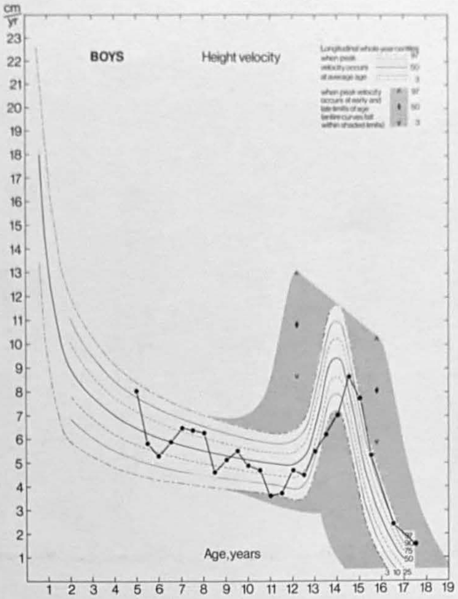
The bone maturity curve reflects the late spurt also, as do the genitalia and pubic hair ratings, which are between the 3rd and 10th centiles.

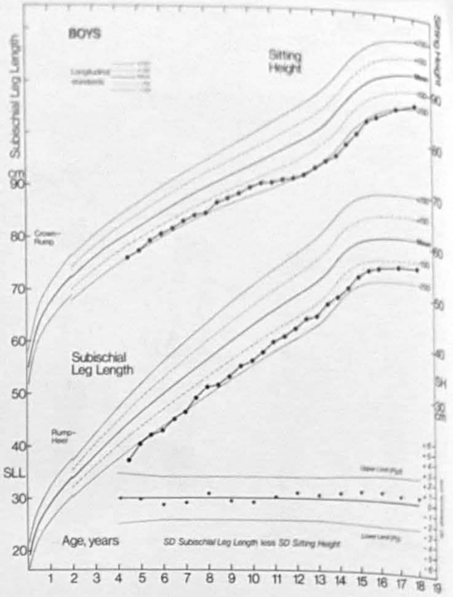


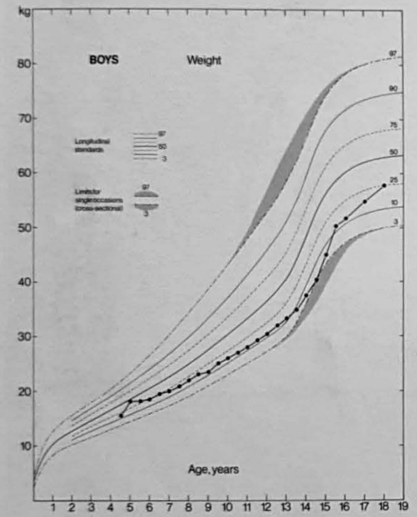
Age, years

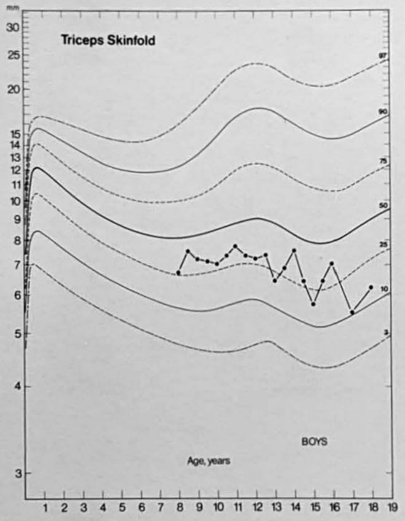
An athletic-looking boy, somatotype 34½3, of slightly less than average size.

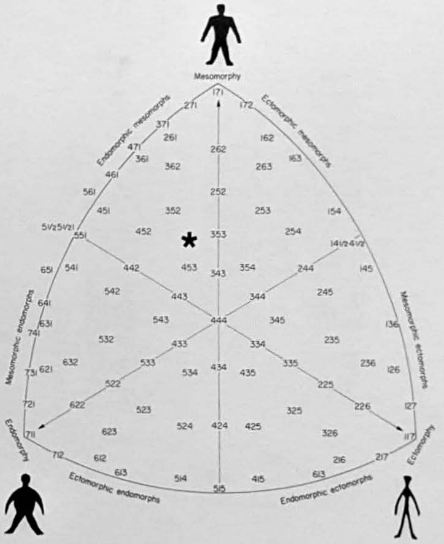


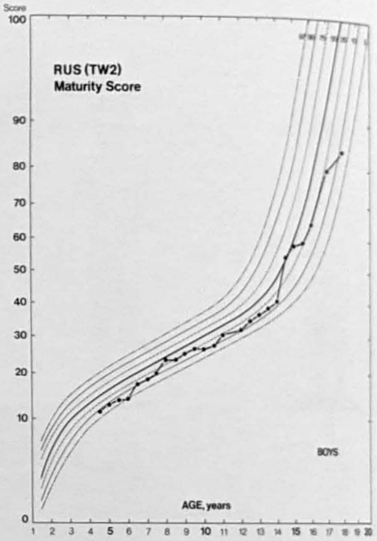


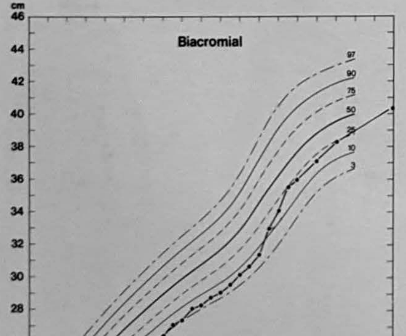


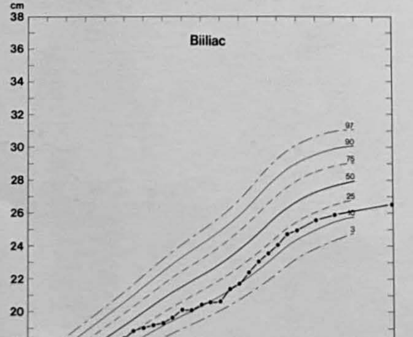












Normal Boy

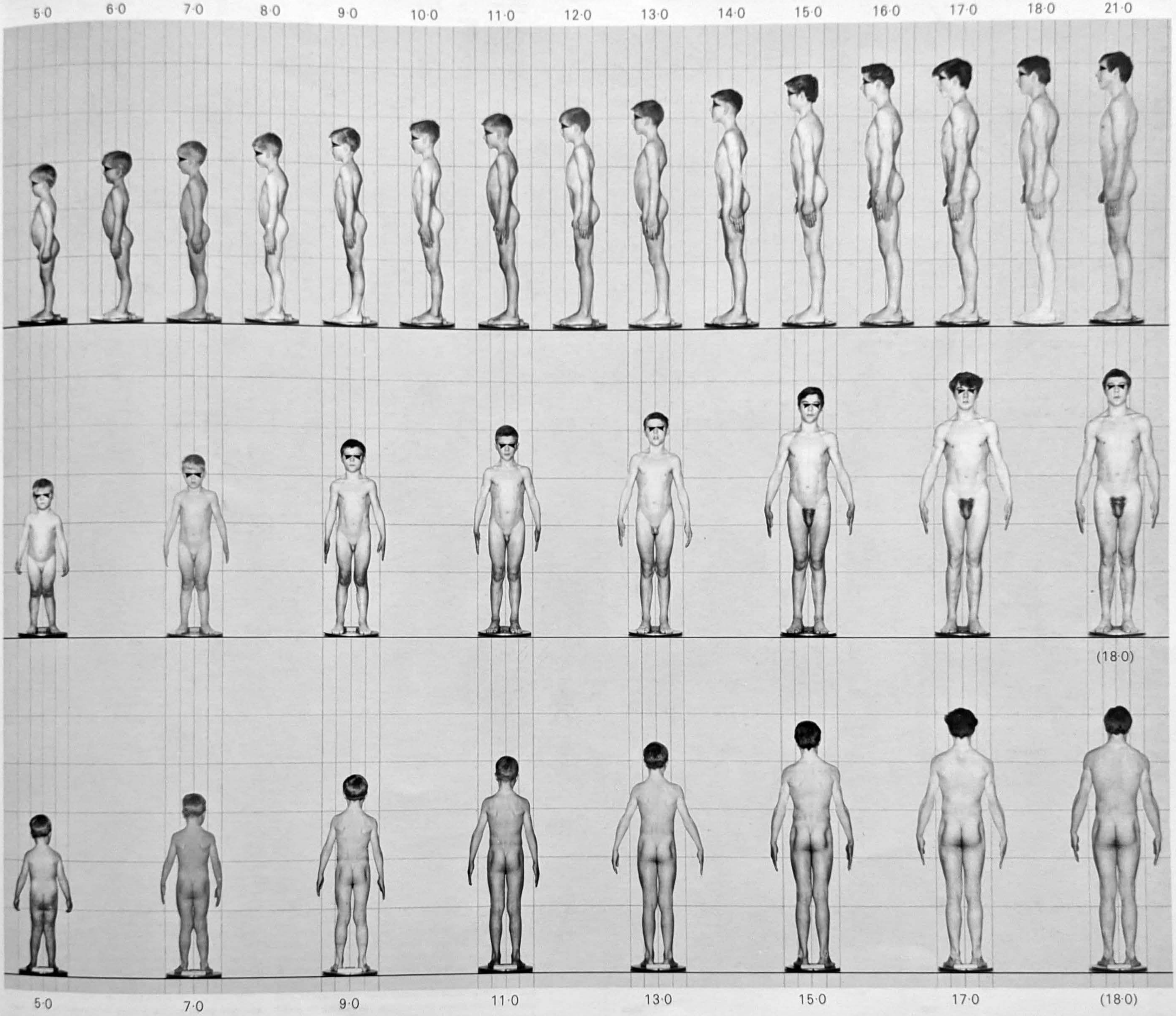
Subject No. 12

Another predominantly mesomorphic boy, somatotype 34½2½, but of small size. Height follows the 3rd centile throughout except that it falls still further at puberty, since peak height velocity is reached 6 months later than average. The height velocity is rather unstable, apparently with periods of low velocity followed by minor catch-ups. The first velocity very likely represents such a catch-up, which is entirely in leg length. The same sort of curve characterized this boy's two sisters, one of whom is subject no. 44. Sitting height is consistently at −2 SD and leg length rises gradually from −2 SD to −1·2 SD.

In contrast to height, weight, except at age 5, shows a very smooth curve. This subject's sisters are fat, but his own triceps skinfold stays at around the 25th centile. His biacromial diameter shows a most unusual degree of change, from the 3rd centile at 6 to the 25th at 16 and the 50th at 21. Biiliac diameter stays between the 10th and 25th centiles.

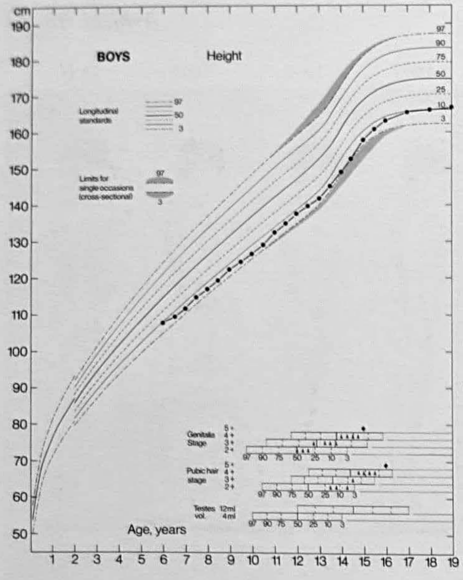
Bone maturity score is a little lower than average, corresponding to the age at peak height velocity. At age 18 the epiphyses are still not finally fused. Genitalia and pubic hair stages are also reached a little later than average.

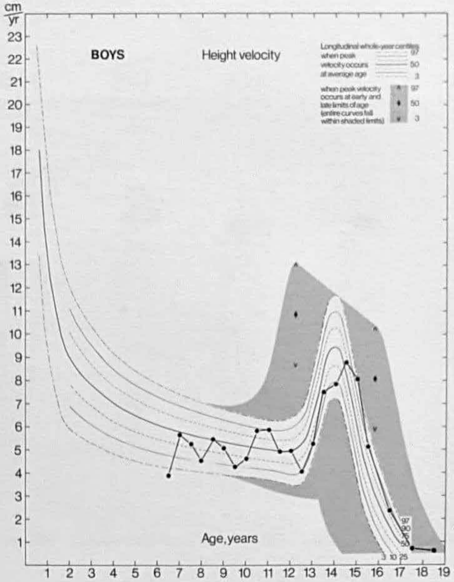
The pictures show marked genu valgum (knock knees) at age 5 but the subject grows out of this spontaneously and it has practically disappeared by age 18 (see Asher, 1975).

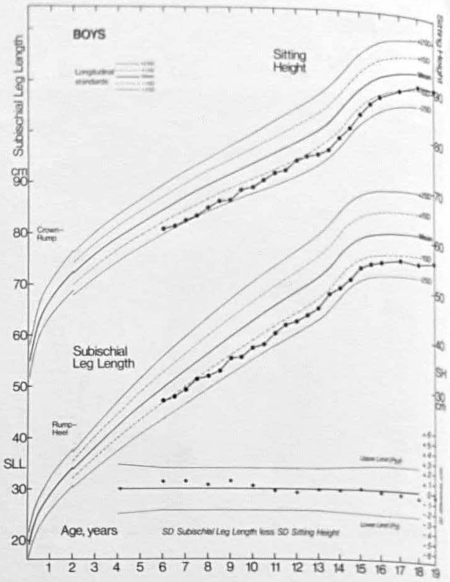


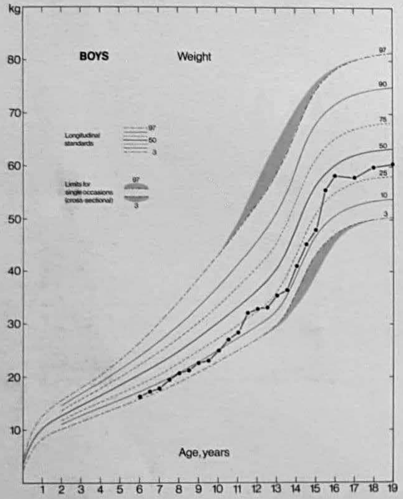
Age, years

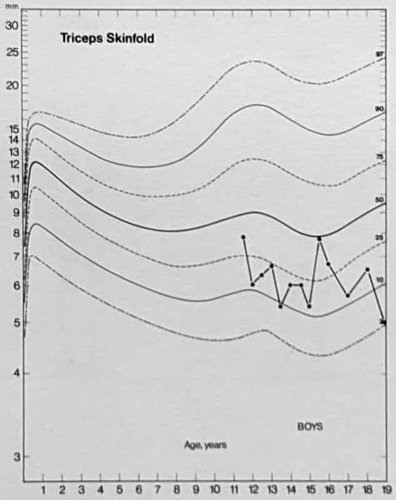
A very small, predominantly mesomorphic boy, somatotype 34½2½, with an average adolescent spurt.

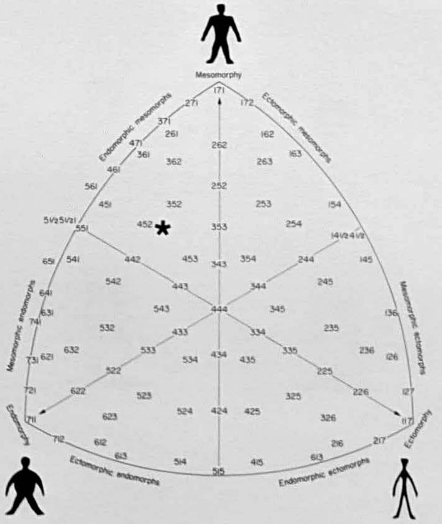


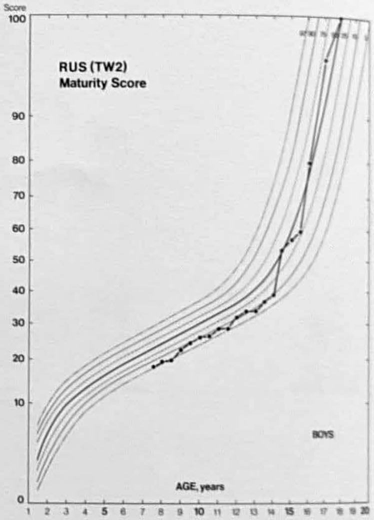


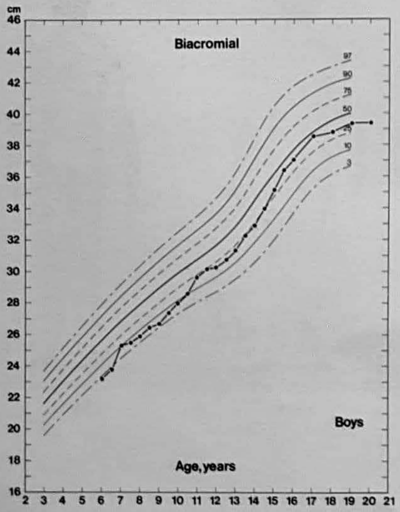


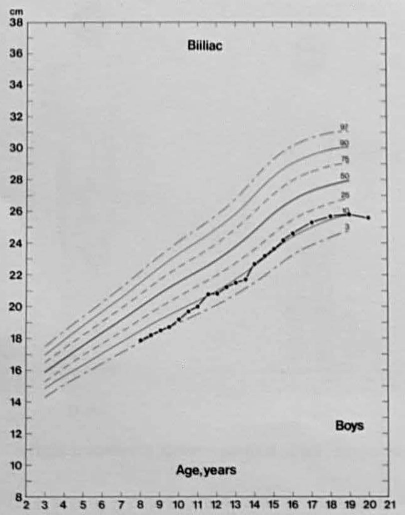












Normal Boy

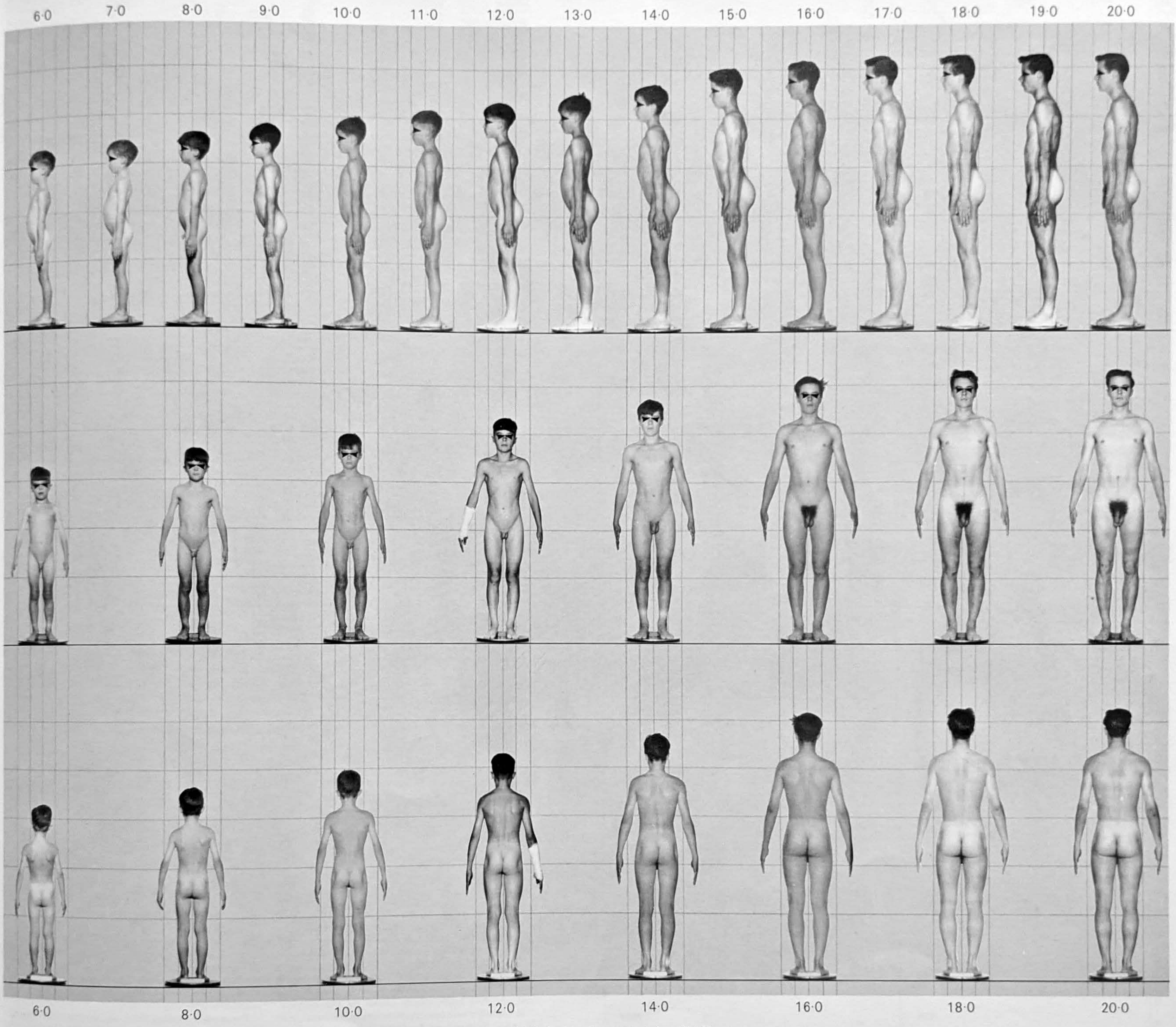
Subject No. 13

A predominantly mesomorphic boy, somatotype 3½4½2, on the small side, with height initially at the 5th centile, rising to the 10th at adulthood. His height velocity is somewhat irregular; between 10 and 12 there is a minor spurt which is also reflected in biacromial diameter and in weight. After a year of relative pause the growth spurt begins and its total effect is a little greater than average, thus taking the height from the 5th to the 10th centile.

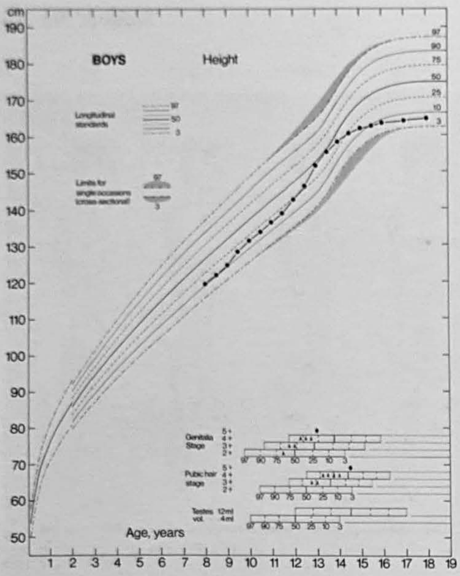
Sitting height and leg length follow similar curves to height; the proportions are close to average.

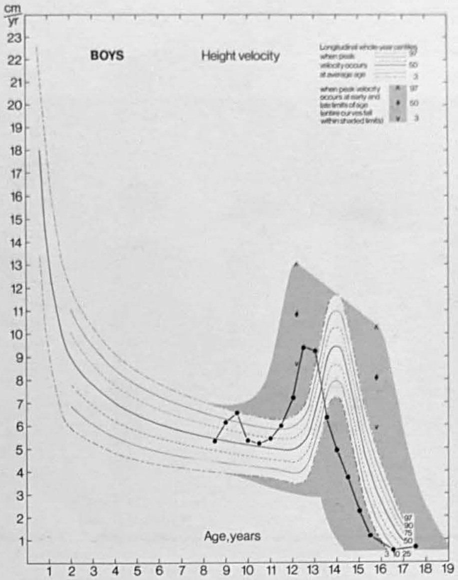
Biacromial diameter shows a gradual rise through the centiles, signifying a velocity always slightly above average. Biiliac diameter alters its position very little. Skinfolds gradually fall. Bone maturity at first is rather delayed, but becomes average at puberty. Genitalia and pubic hair stages are all later than average, with pubic hair the more delayed.

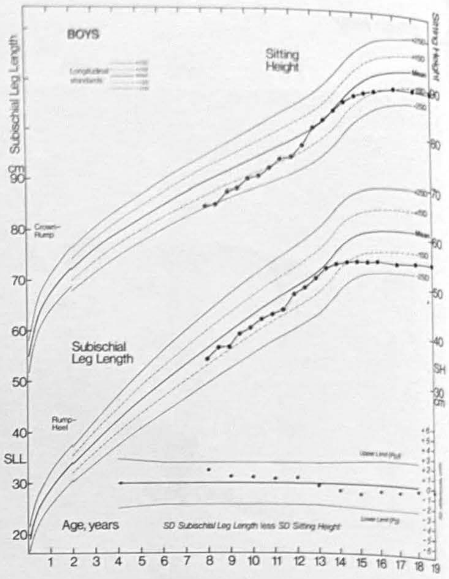
This boy, like subjects 4 and 7, is a little bow-legged, but in this case we cannot put it down to his wide pelvis, for his centile position of biiliac diameter (which may not accurately reflect biacetabular distance of course) is no greater than that of height and considerably less than that of biacromial diameter.

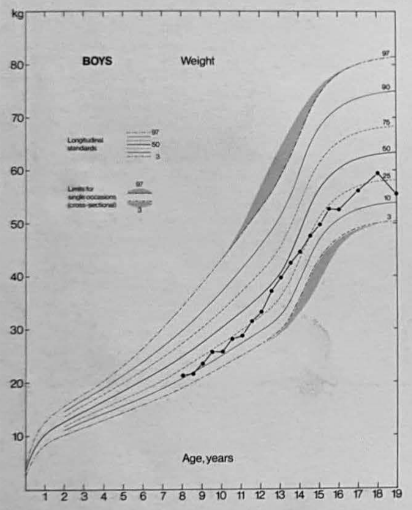


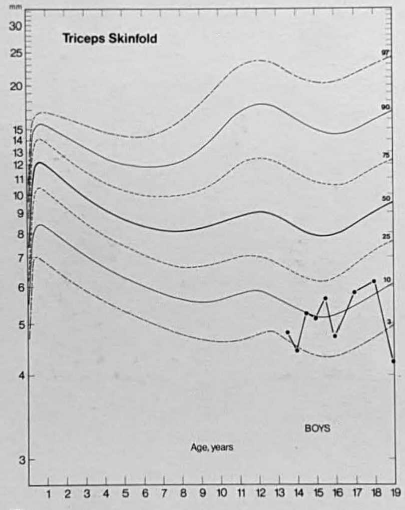
Another athletic-looking boy, somatotype 3½4½2.

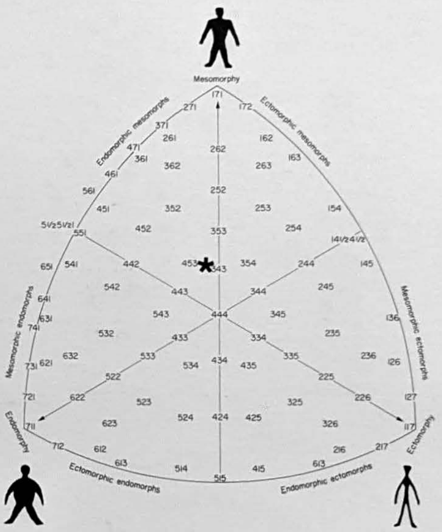


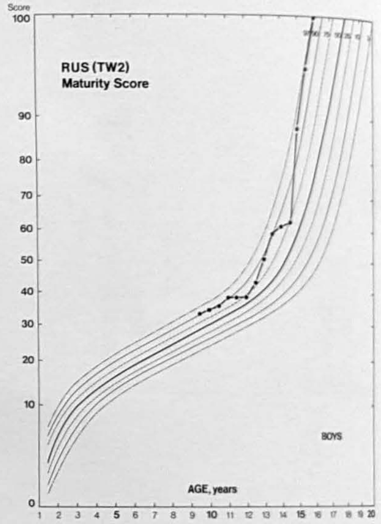


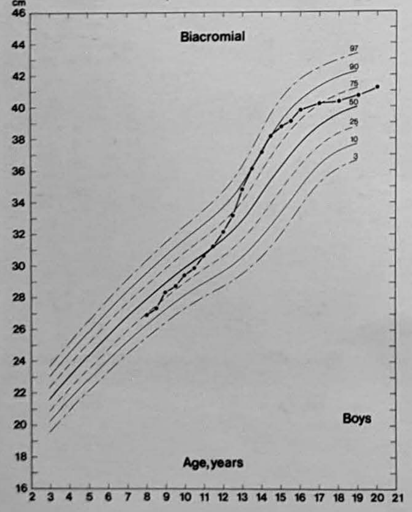


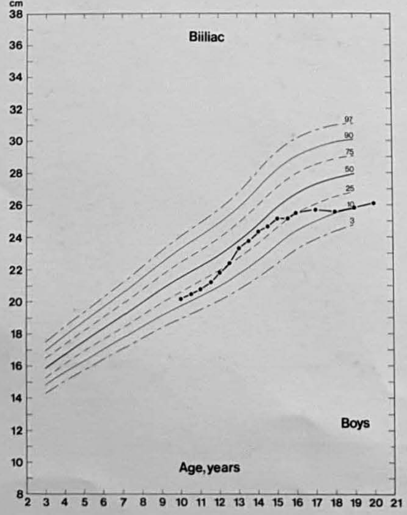












Normal Boy

Subject No. 14

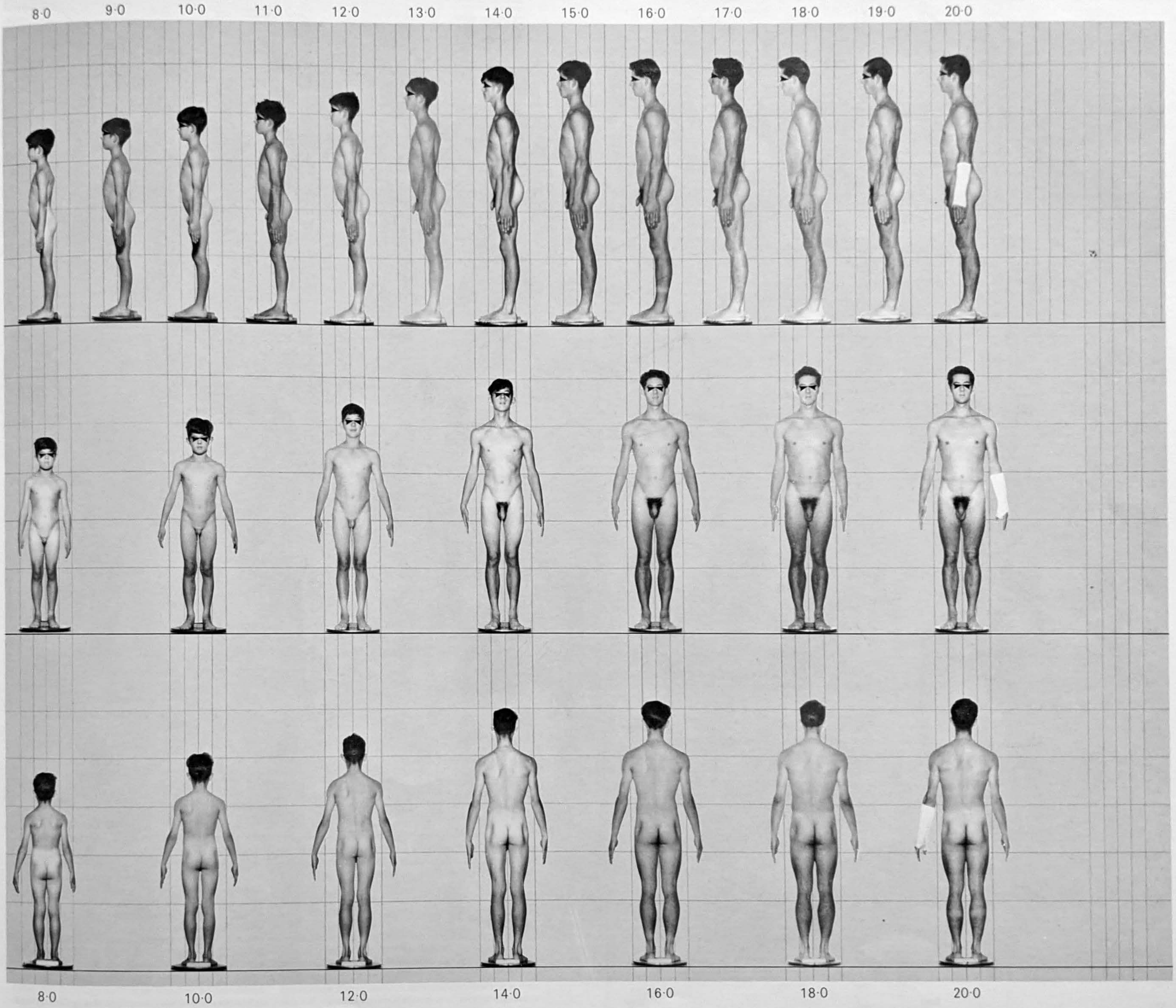
The last of our series of predominantly mesomorphic boys; his somatotype is 3½4½3 and like the preceding, also mesomorphic, subject (no. 13) he has a broken arm on one occasion. He has a very early adolescent spurt (+1·5 SD in timing) and in consequence his height centile rises from the 10th at age 9 to reach the 50th at 13·5, thereafter falling back to the 5th at maturity. Peak height velocity reaches the 35th for peak.

Sitting height has a considerable spurt and rises from −2 SD at 8 to −1 SD at maturity. Leg length, on the other hand, has a small spurt and falls from −0·8 SD at 8 to −1·5 SD at maturity. Thus though at any given time the difference between the two SD scores is within normal limits (bottom of chart) it changes from +1·2 (long legs) at age 8 to −0·4 at age 18.

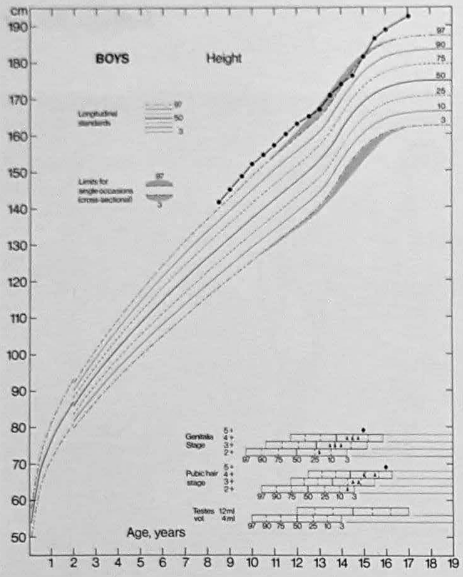
Biacromial diameter has a considerable spurt superimposed on an always greater-than-average velocity. Thus from the 25th centile at age 9 it rises to the 50th by the time the spurt starts, then reaches the 90th and finally ends at the 75th. Biiliac diameter shows no such effect, beginning at the 15th and ending at the 10th.

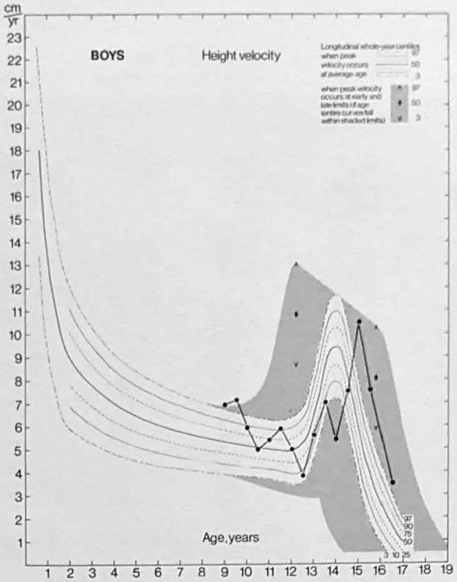
The skinfold is always rather low, and the bone maturity is always advanced, eventually reaching the 97th centile at the time of epiphyseal fusion.

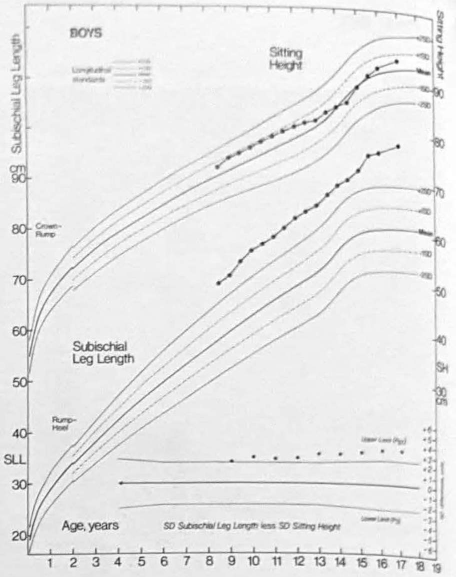
Genitalia and pubic hair stages are also advanced, the former to about the 90th centile, the latter to the 75th.

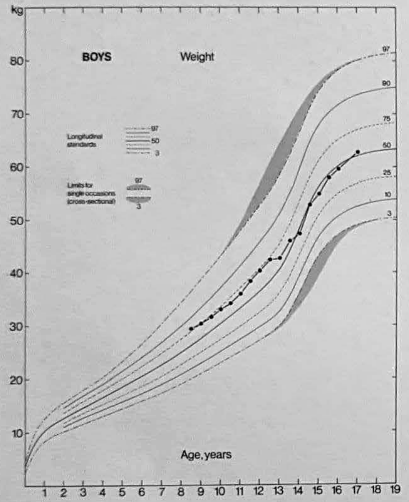


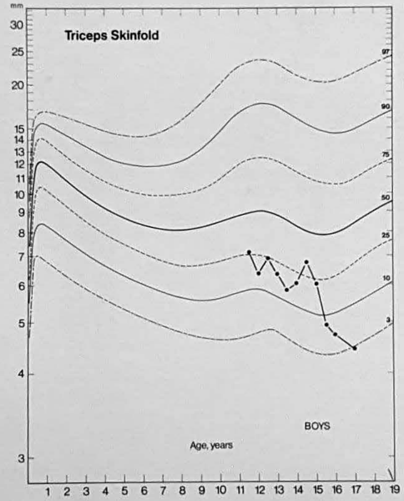
A very early-maturing, predominantly mesomorphic, athletic boy, somatotype 3½4½3.

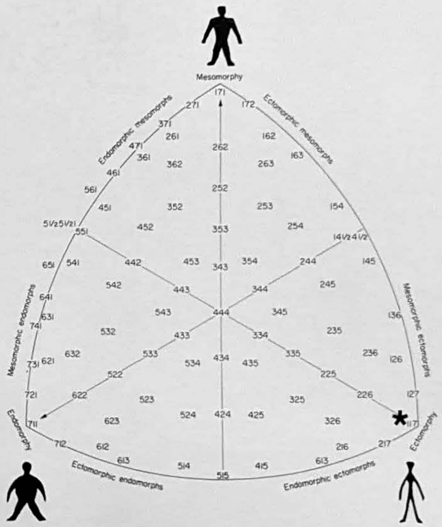


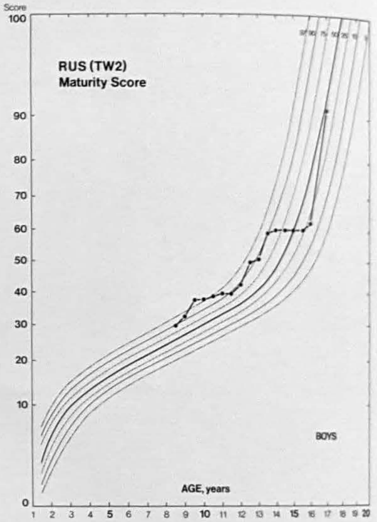


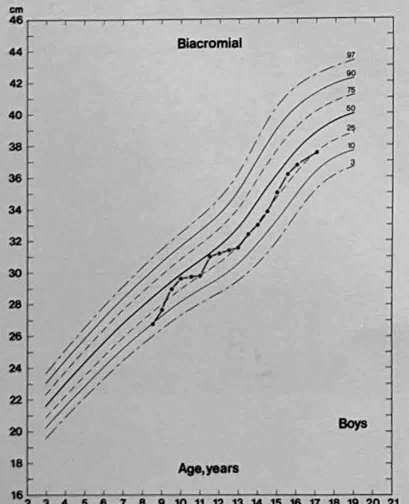


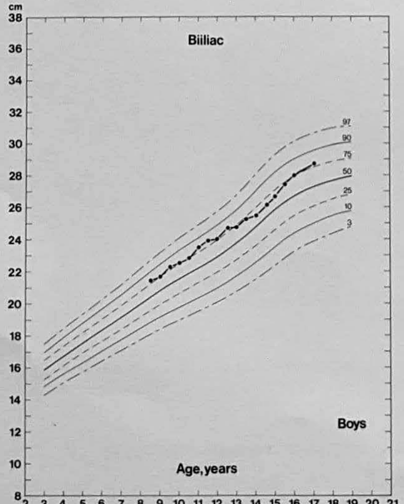












Normal Boy

Subject No. 15

We now turn to a group of predominantly ectomorphic somatotypes. This boy is the highest in ectomorphy in our series; indeed with a somatotype of 1½1½7 he is quite near the European extreme. He is also very tall, because of his extremely long legs.

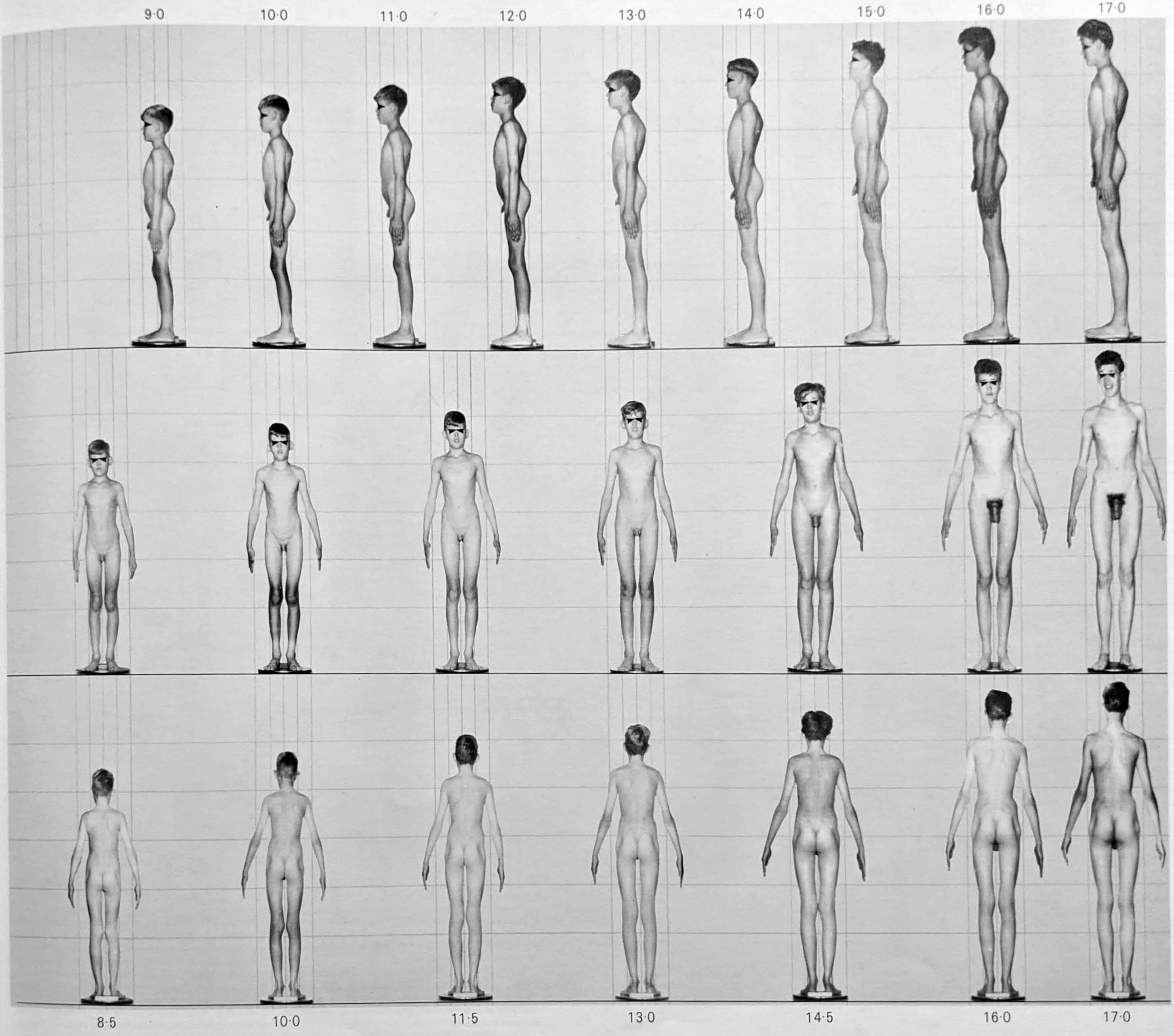
He has a very marked adolescent growth spurt, peak height velocity nearly reaching the 97th centile, about a year later than average.

Height is already a little above the 97th centile at age 8·5 but with puberty rises to well above the 97th. At puberty this boy seems to have two waves to his height spurt, with a pause from 13·5 to 14·5 years. This is associated with a rise in skinfold such as would occur if the check in height growth were due to a temporary diminution in growth hormone secretion. We have seen the same thing to a greater, indeed unmistakeable, degree in girls in boarding schools under the stress of changing schools or seeing their families go overseas. In principle a double-peak height curve might also be explained by an out-of-phaseness between sitting height and leg length spurts; but this does not occur in this subject.

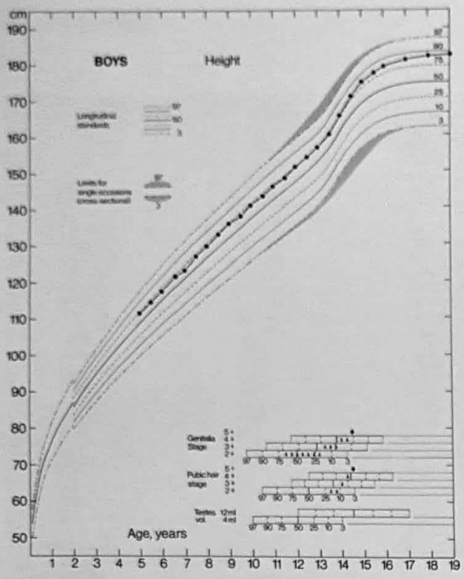
Sitting height is initially at +1 SD and ends at +0·8 SD, whereas leg length is at +3 SD before puberty and at +4 SD after puberty. These are the so-called "eunuchoid" proportions, but genital and pubic hair development is entirely normal. Leg length SD less sitting height SD is throughout beyond the normal limits.

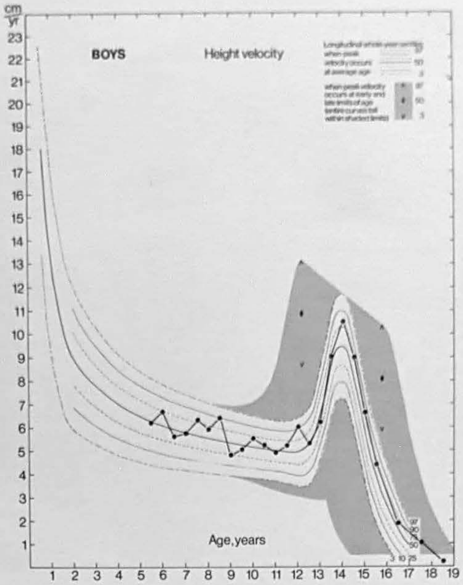
Biiliac diameter throughout remains at the 75th centile, but biacromial is only at the 25th. Triceps skinfold, never very high, drops sharply at puberty.

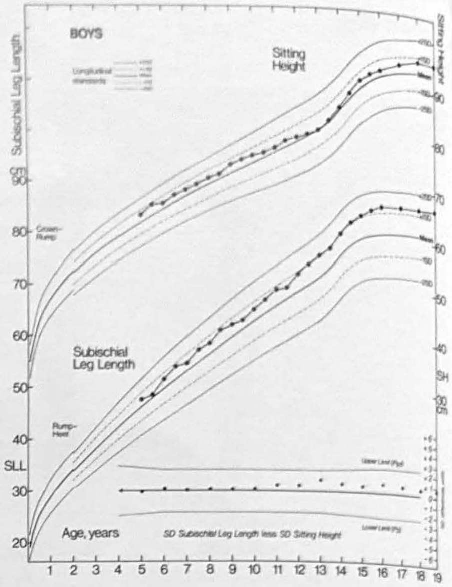
Bone maturity is at first surprisingly advanced, which seems at odds with the late height spurt. From age 13·5 to 16 however, no advance whatever takes place, thus allowing the large height spurt to develop before epiphyseal fusion occurs. The timing of genitalia and pubic hair stages, averaging about 10th and 5th centiles respectively, agrees with the second wave of the height spurt.

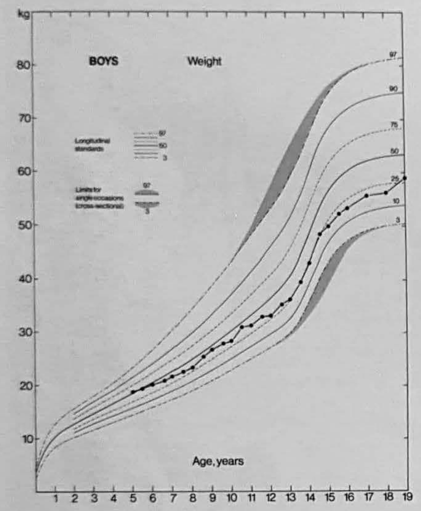


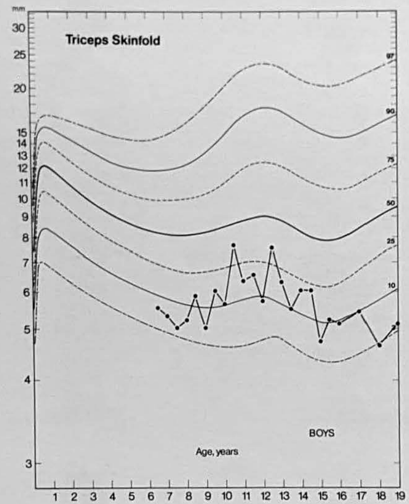
An extremely ectomorphic boy, somatotype 1½1½7, with unusually long legs.

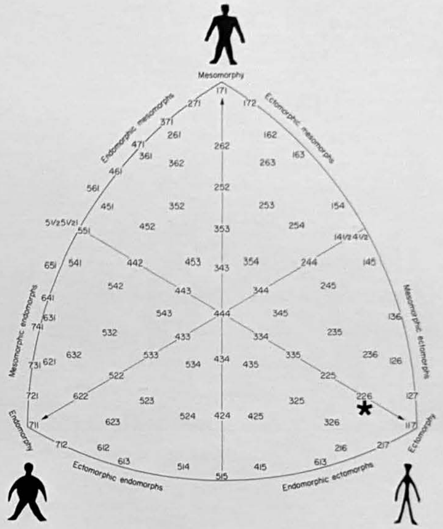


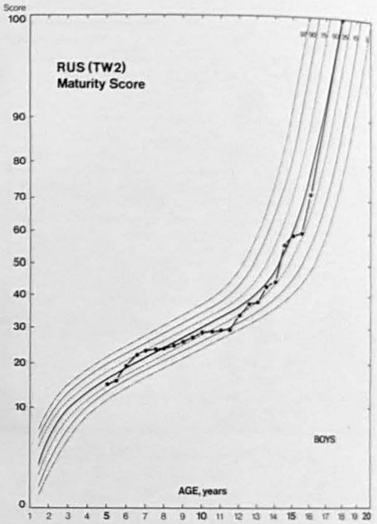


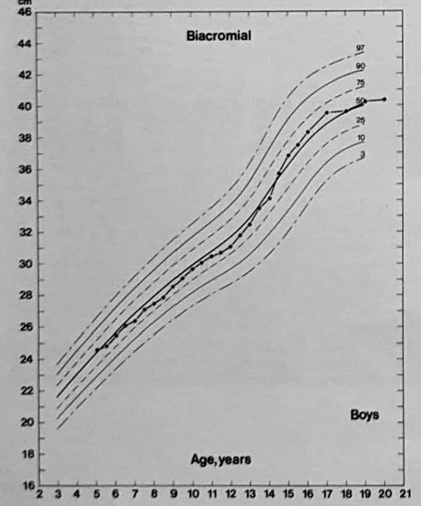


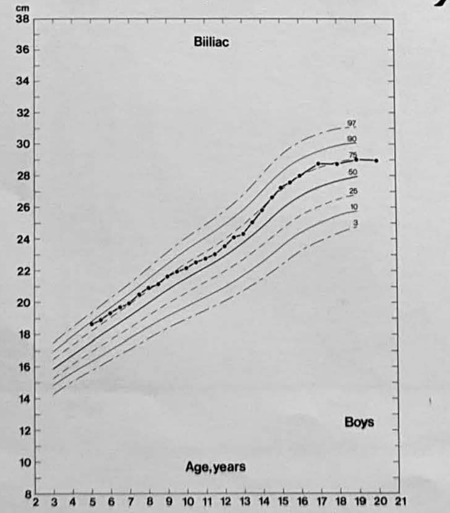












Normal Boy *Subject No. 16*

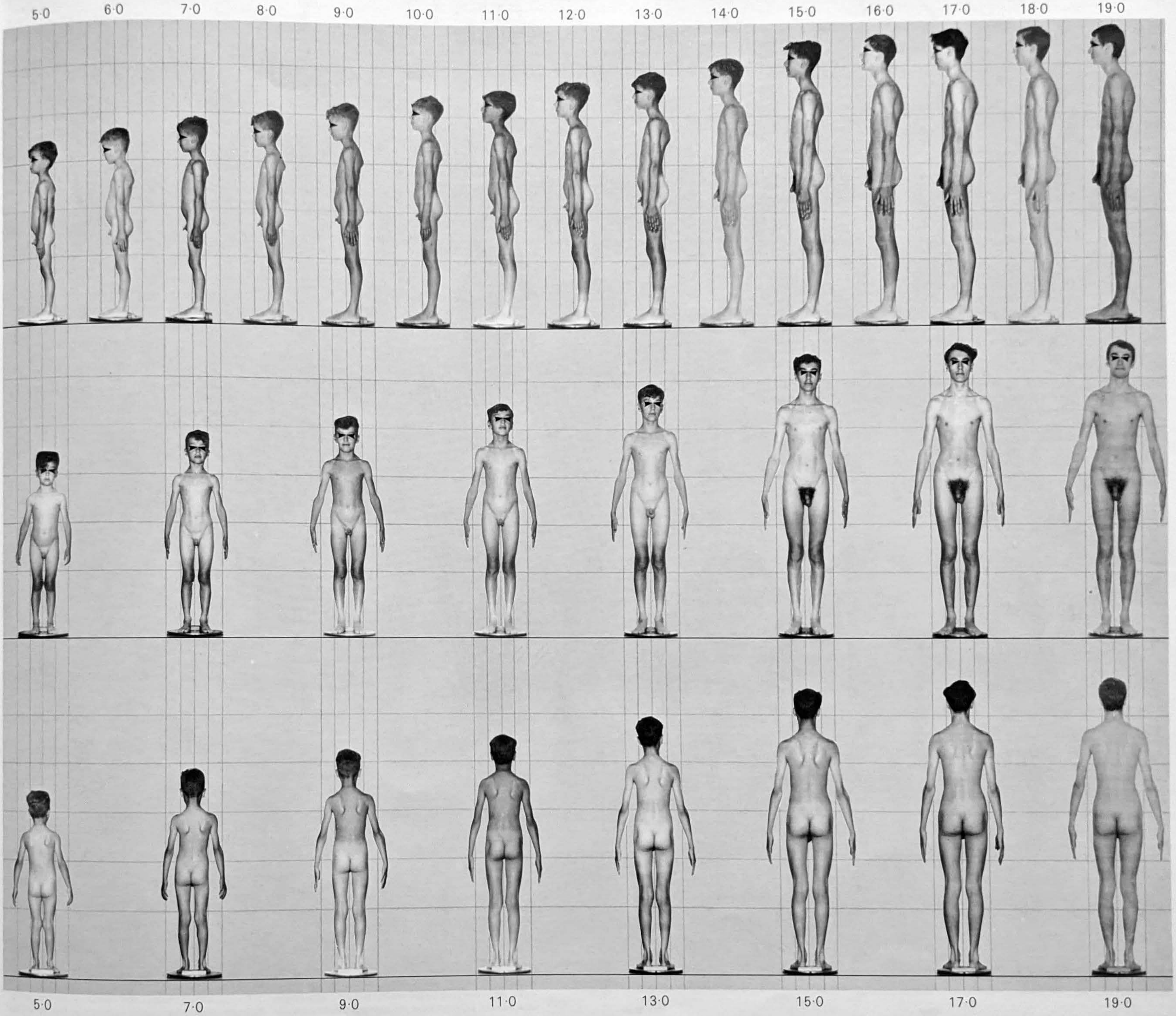
A much more usual example of a very highly ectomorphic boy than the last subject. His somatotype is 226, and his height between the 75th and 90th centiles, with leg length and sitting height in near-average proportion.

The height velocity curve is very consistent both in form and timing, with peak height velocity reaching the 75th centile at exactly the average age. In consequence, this boy maintains nearly the same height centile from 5 till mid-puberty and then increases it modestly.

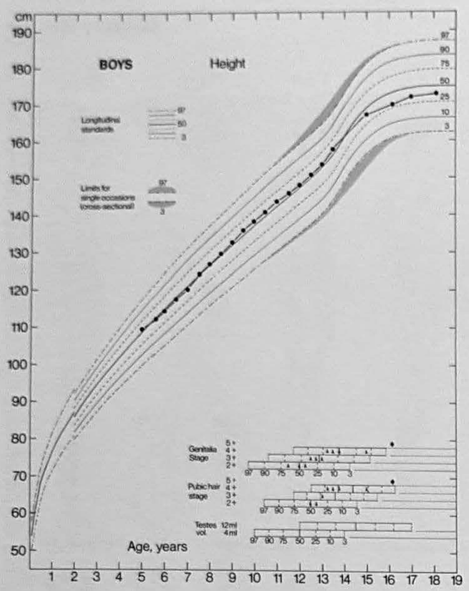
Sitting height and leg length centiles are both similar to the height centile, and their relationship one with another is highly consistent, with leg length slightly greater from the beginning of puberty onwards.

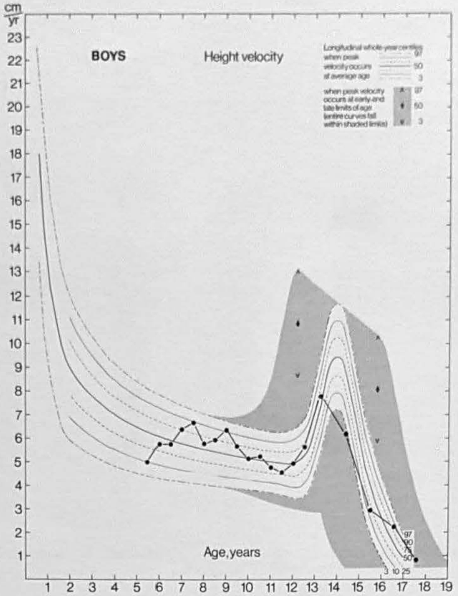
Biacromial and biiliac diameters approximate the 50th and 75th centiles respectively throughout growth. Bone maturity is throughout near the 50th centile. Even the skinfold describes a regular type of curve, around the 10th to 15th centiles. Genitalia stages are a little late, each averaging around the 25th centile; the early stages of pubic hair are also late, but its development is extremely rapid.

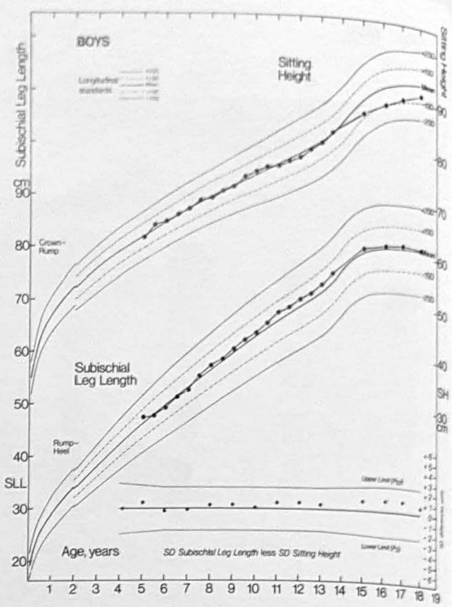
This boy would have delighted the nineteenth century writers on constitution such as Sigaud in Paris and Viola in Bologna. Both thought that a balanced form and an unchanging growth pattern were signs of health and even of excellence. Perhaps, for them, this subject would have been the "golden ectomorph".

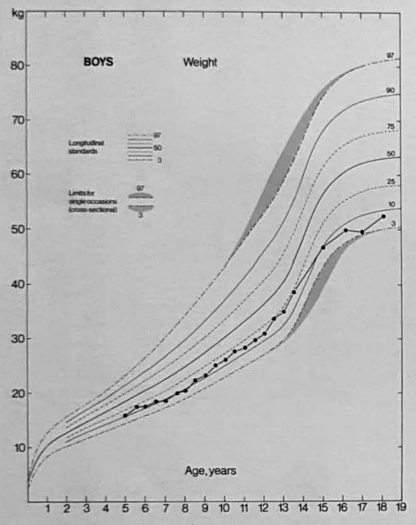


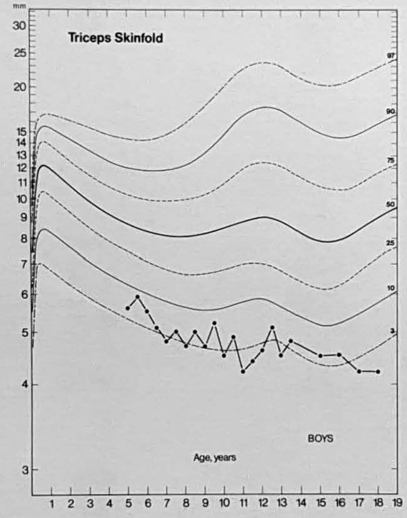
A highly ectomorphic boy, somatotype 226.

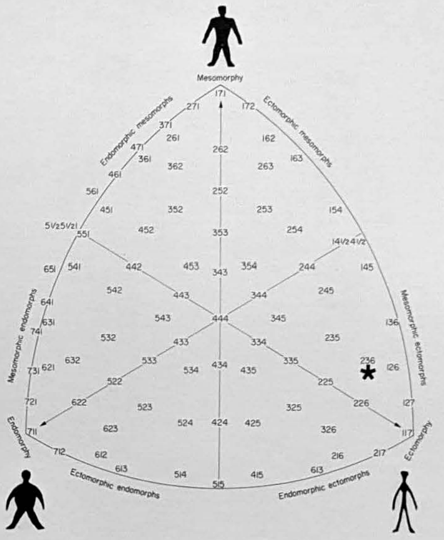


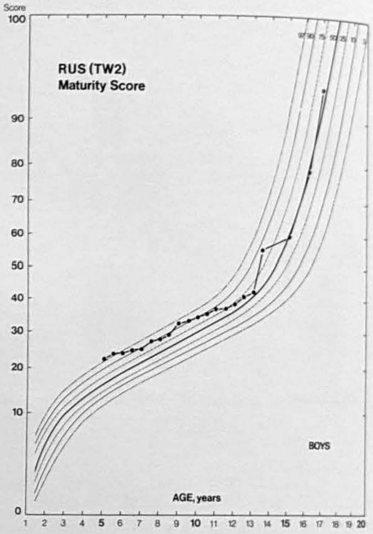


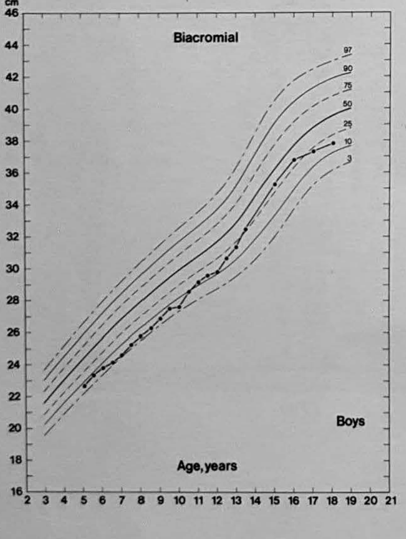


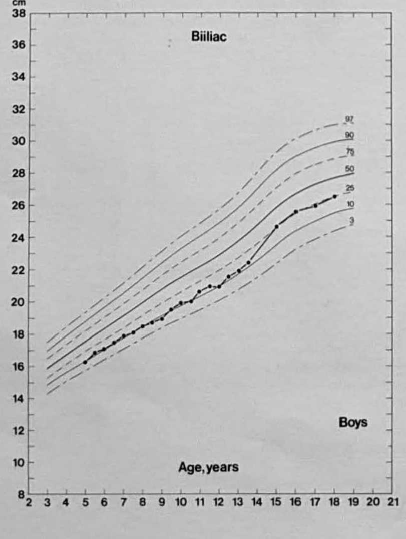












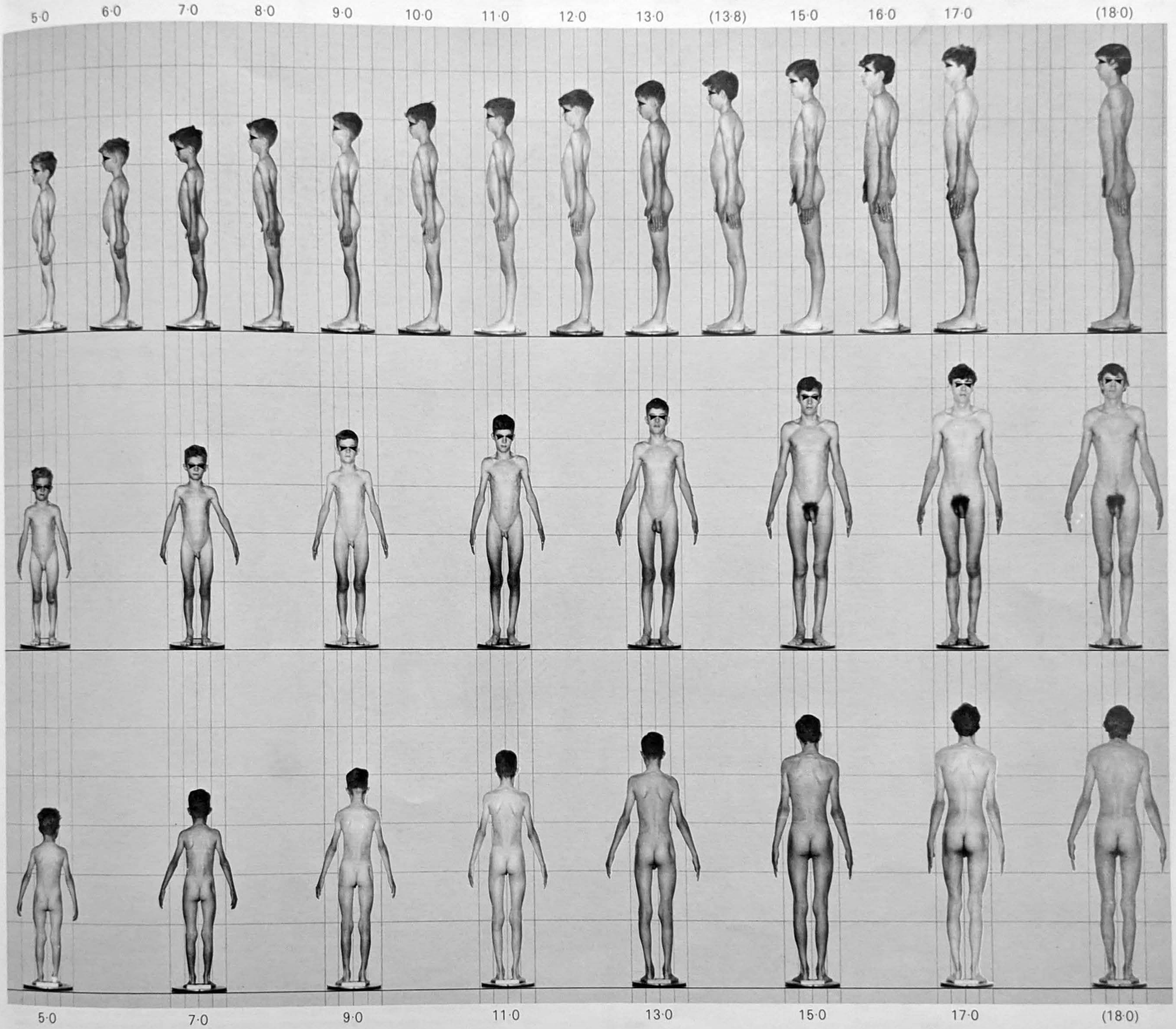
Normal Boy

Subject No. 17

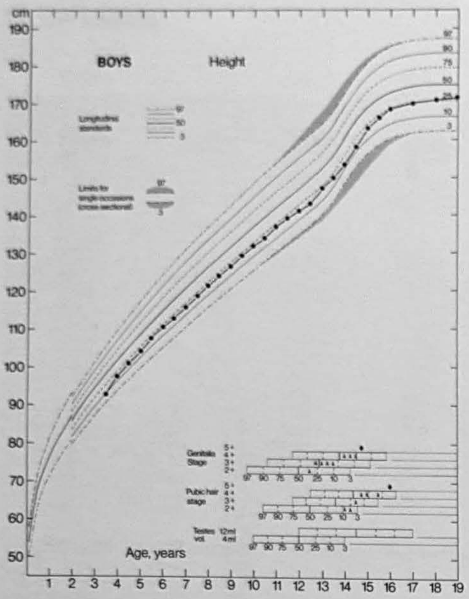
A highly ectomorphic boy, of a little less than average height and a rather low peak height velocity located a trifle earlier than average. Legs and trunk are averagely proportioned till puberty; thereafter sitting height is a little less, relatively, than leg length.

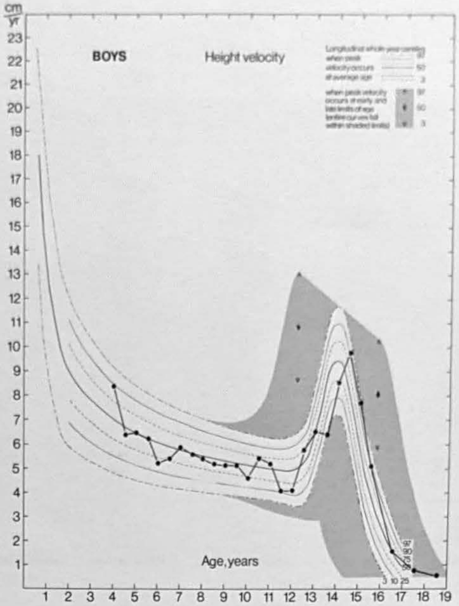
Biacromial diameter increases from the 10th to the 15th centile and biiliac from the 10th to the 25th. Weight remains throughout at the 10th.

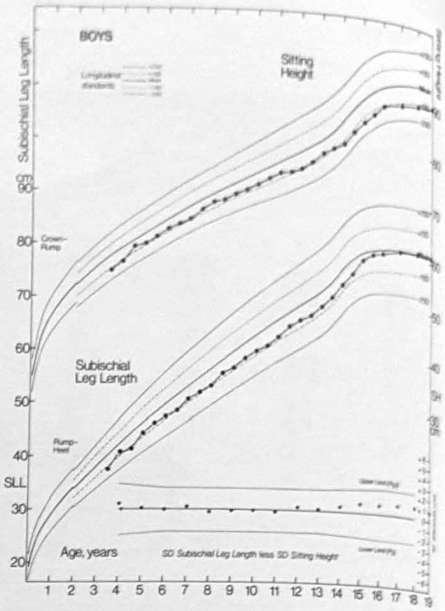
Triceps skinfold remains very steadily on the 3rd centile. Bone maturity is surprisingly advanced at first, as in the previous subject, but has come down to the 50th centile by the beginning of puberty. Thereafter it stays at the 50th centile. Genitalia and pubic hair development are both at the 50th centile.

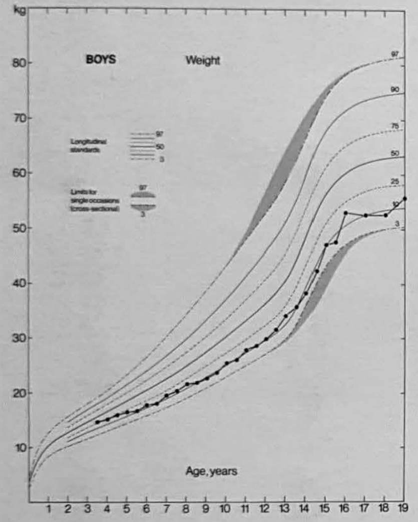


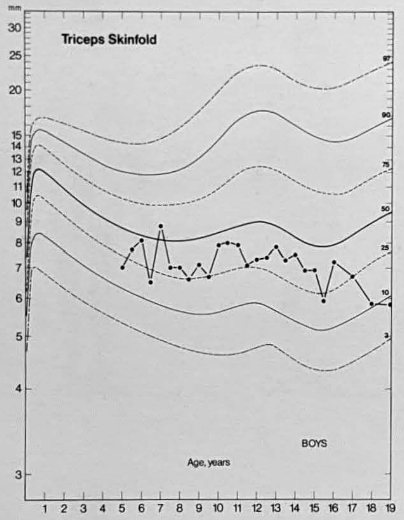
A highly ectomorphic boy, with strong secondary mesomorphy, somatotype 236.

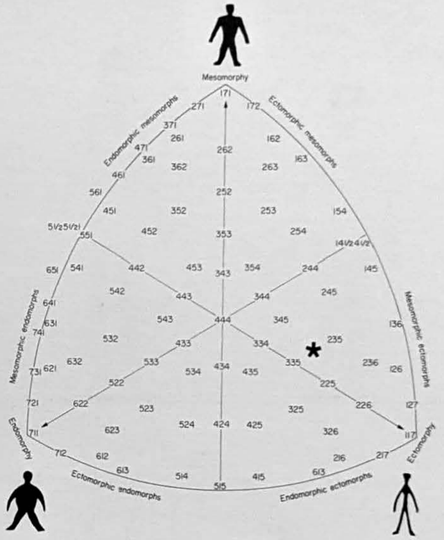


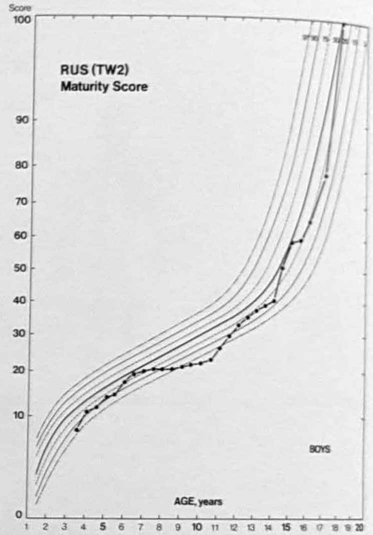


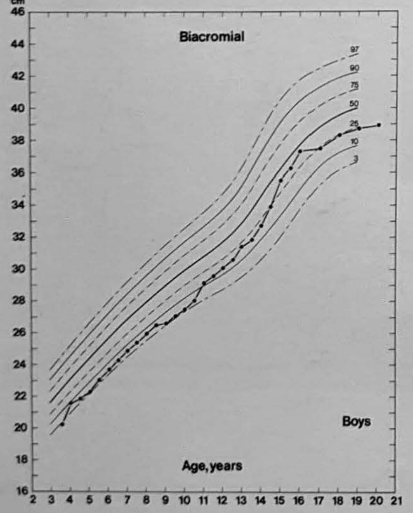


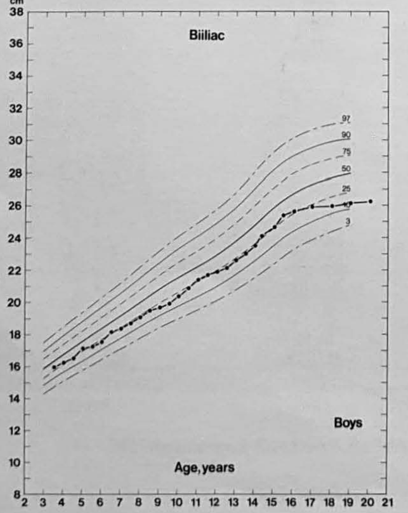












Normal Boy

Subject No. 18

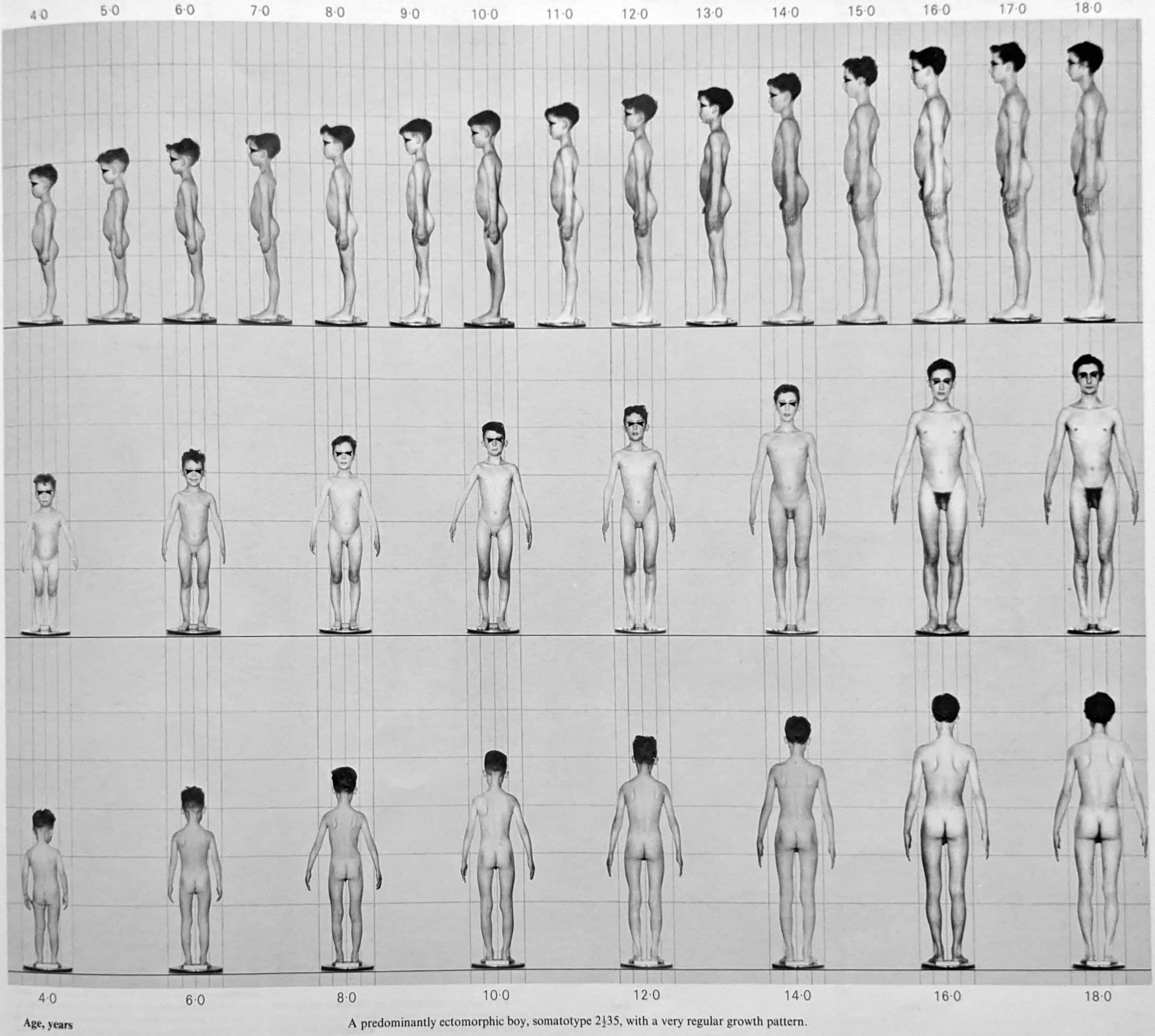
Another predominantly ectomorphic boy of very regular growth pattern. Somatotype 2½35, his height is at the 25th centile throughout, weight at the 10th, sitting height at − 1 SD and leg length at − 1 SD till puberty and then at 0·0 SD.

The height velocity curve is steady around the 50th centile, apart from an initial high value, perhaps representing catch-up, and a brief drop just before the pubertal acceleration (not seen regularly but rumoured to occur particularly in late developers; see subjects 5, 29 and 31, though these curves scarcely carry conviction). Peak height velocity reaches the 65th centile some 6 months later than average. The leg length spurt is marked, and has a peak velocity absolutely greater than that of sitting height, which is very unusual.

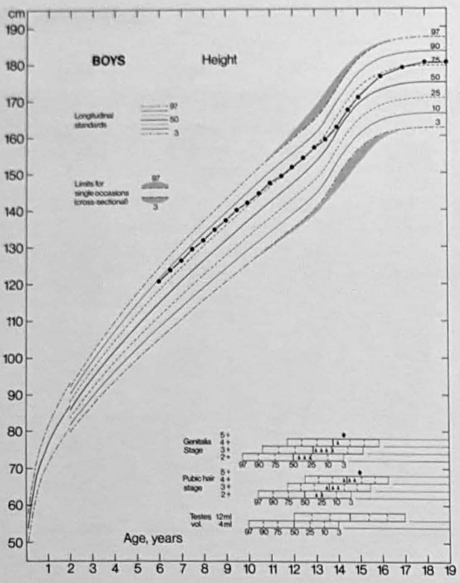
Biacromial diameter increases from the 3rd centile to the 25th; biiliac stays very constant on the 25th till late puberty when it levels off early, at the 15th. Triceps skinfold is throughout around the 25th except that no increase after puberty is seen. This may partly account for the biiliac measurement not recovering to the 25th, for though the technique is designed to eliminate the effect of fat over the bone it does not always succeed in doing so.

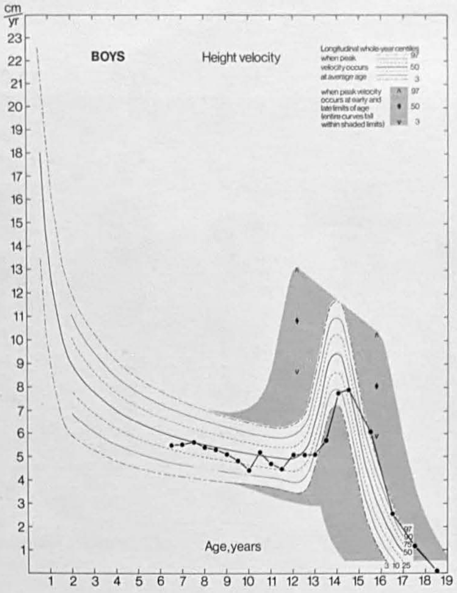
The bone maturity score is interesting in that from 6·5 to 10·5 it stays practically constant, and thus drops through the centiles. By age 10·5 bone age is quite seriously delayed. It then rises at just the same time that the biacromial diameter shows an early increase from the 3rd to the 25th centile, before the adolescent spurt proper. This is well before any spurt in height or sitting height. Endocrine data appear to show that there is an early rise in adrenal androgen secretion at this time.

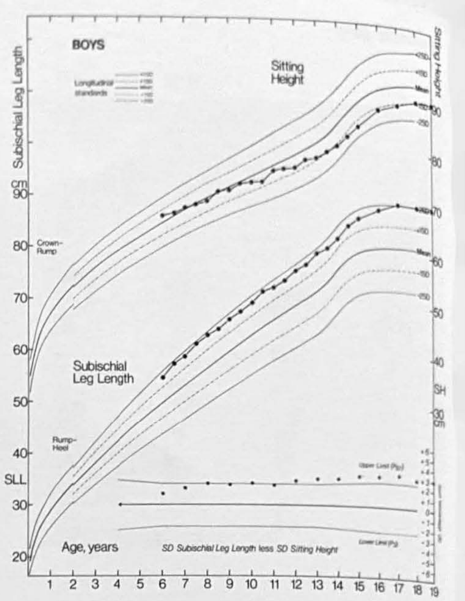
The genitalia stages take place about 6 months later than average, like peak height velocity; pubic hair stages were mostly reached about a year late.

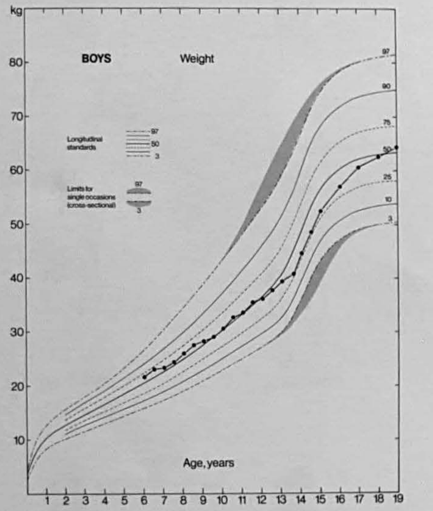


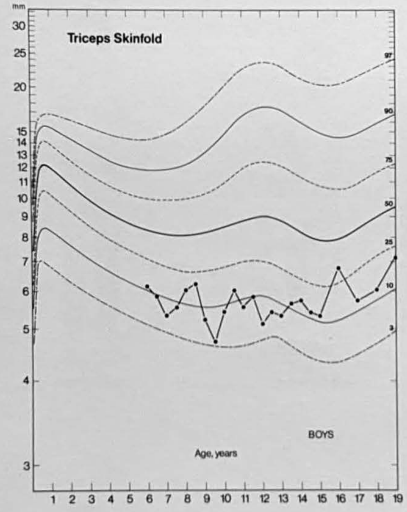
A predominantly ectomorphic boy, somatotype 2½35, with a very regular growth pattern.

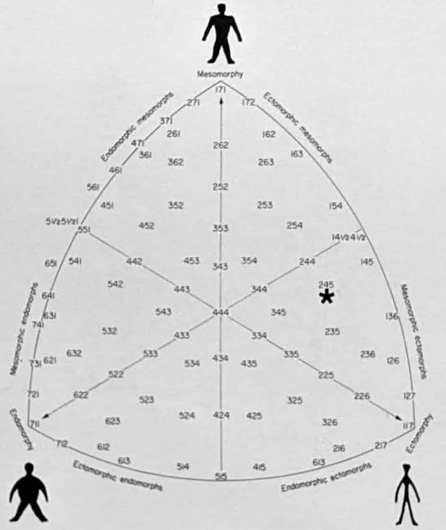


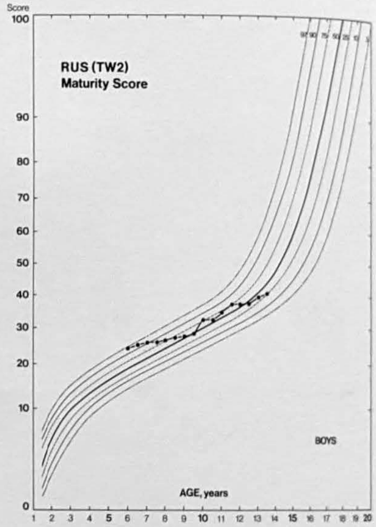


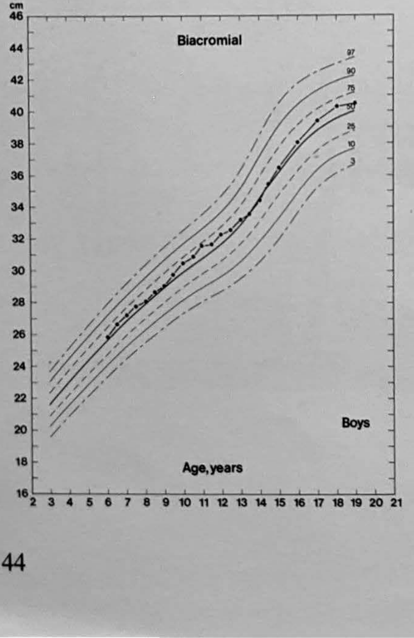


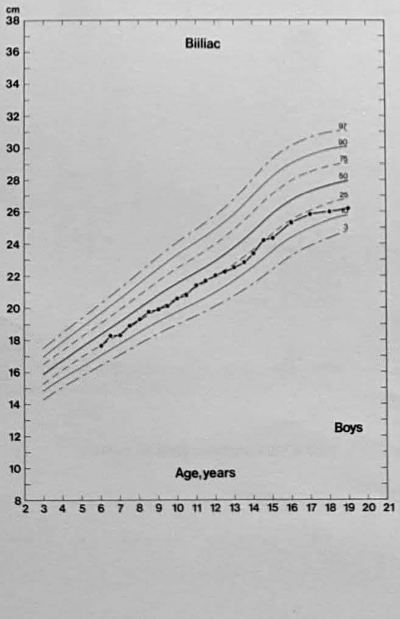












Normal Boy *Subject No. 19*

A second subject of African parentage, predominantly ectomorphic but with a good deal of mesomorphy, somatotype 245. Like the other African subject he has the typical long legs, slender hips and low triceps skinfold. He also is somewhat lordotic at the early ages, but this becomes less pronounced later.

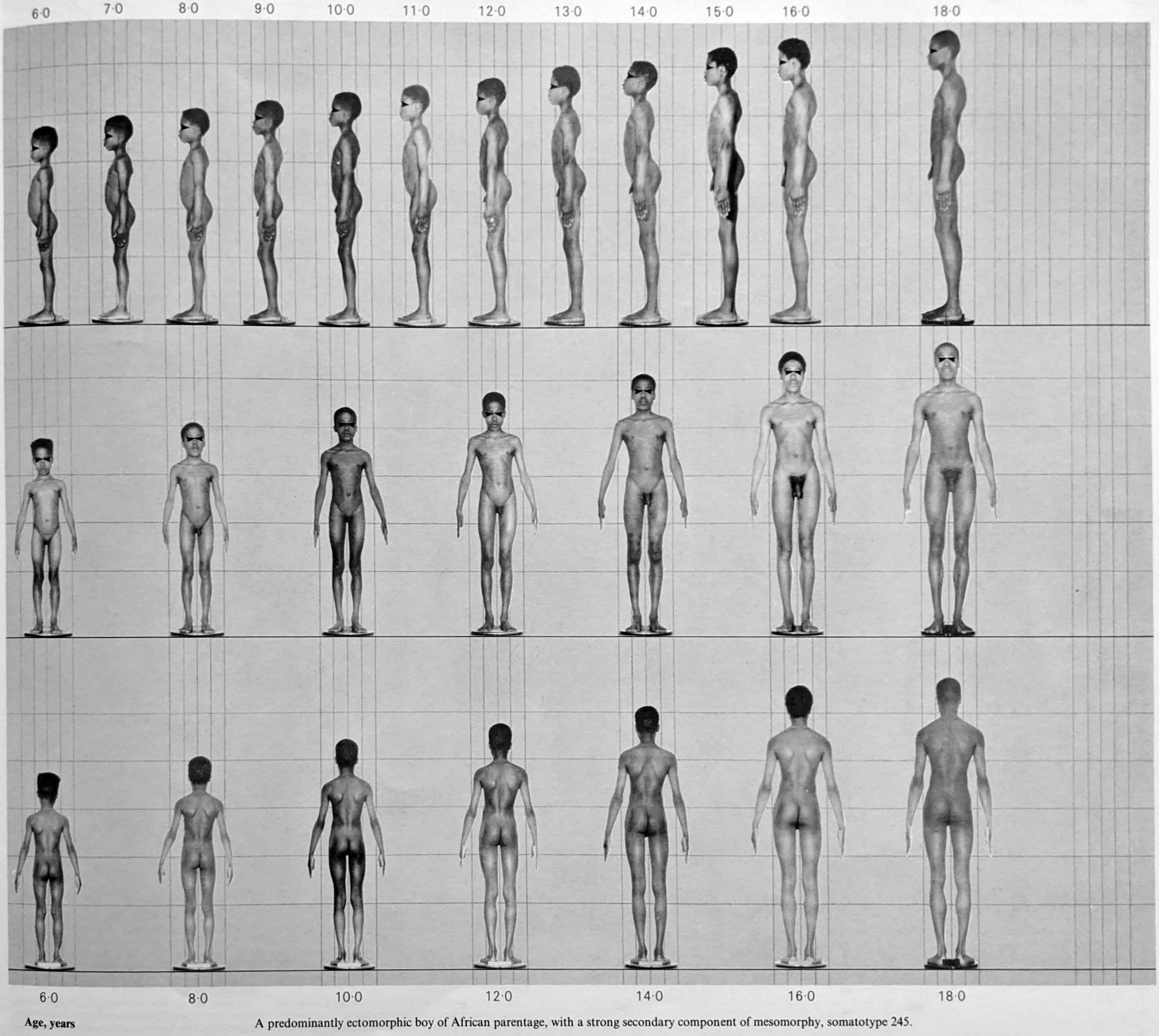
He is a tall boy, with height at the 75th centile all the time except briefly at puberty, due to a slightly later than average spurt. Peak height velocity is rather low, but the height spurt is prolonged and so about average in its total effect.

Leg length is at nearly +2 SD throughout, and sitting height decreases from +0·2 SD to −1 SD. Thus the difference between the SD scores is +1·0 at first, but soon rises to reach at age 8 the upper limit of leg length for sitting height in Europeans, and to exceed that limit from age 12 onwards.

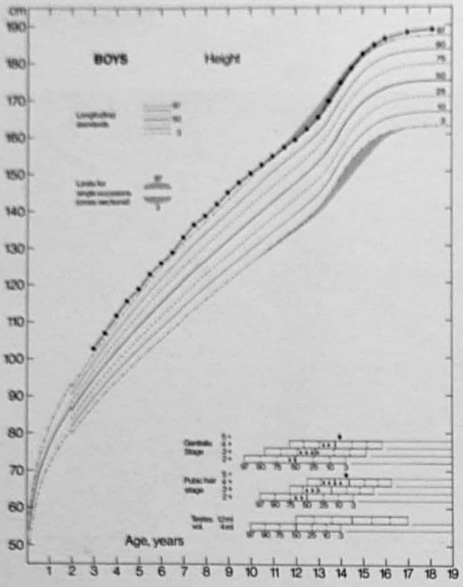
Biacromial diameter is between the 50th and 75th centiles, and biiliac diameter is initially at the 25th and finally at the 15th. Skinfold approximates the 15th centile throughout.

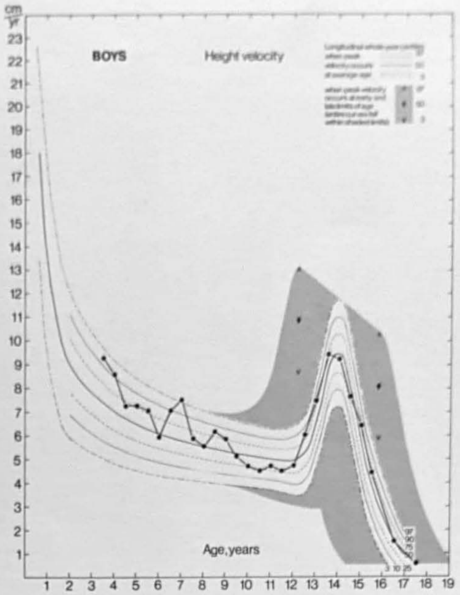
The bone maturity scores are advanced at first, reach the 50th centile at age 10, and thereafter stay at about that level.

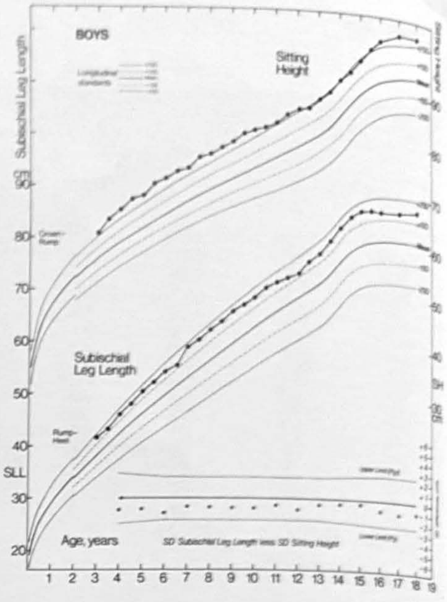
Genitalia and pubic hair stages are very slightly later than average.

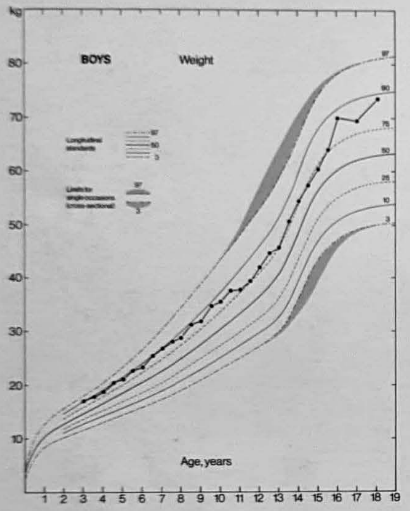


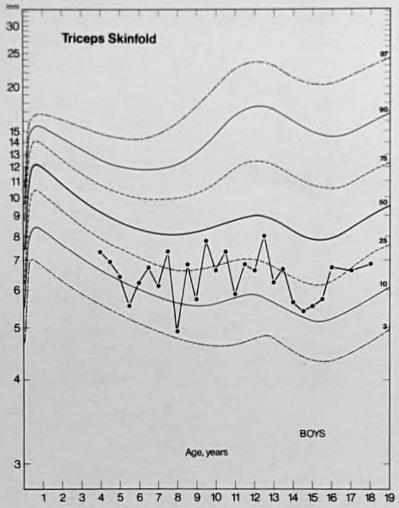
A predominantly ectomorphic boy of African parentage, with a strong secondary component of mesomorphy, somatotype 245.

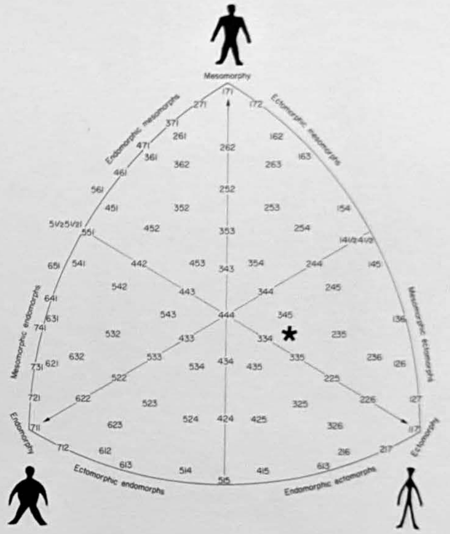


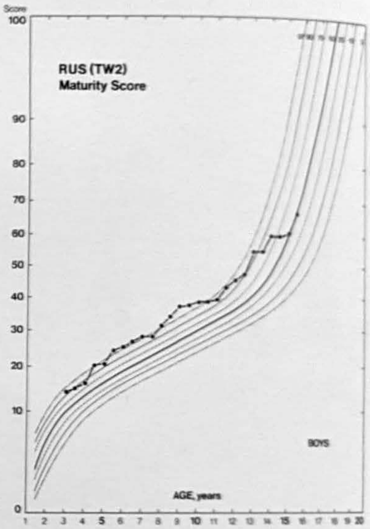


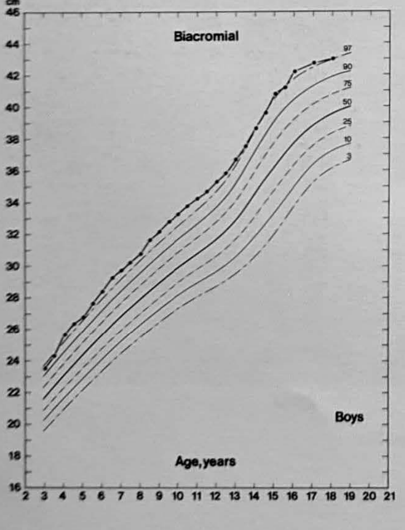


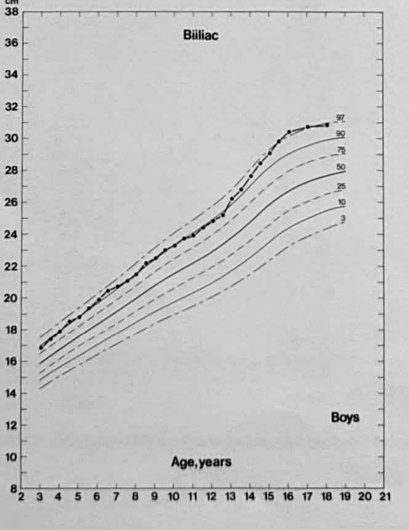












Normal Boy

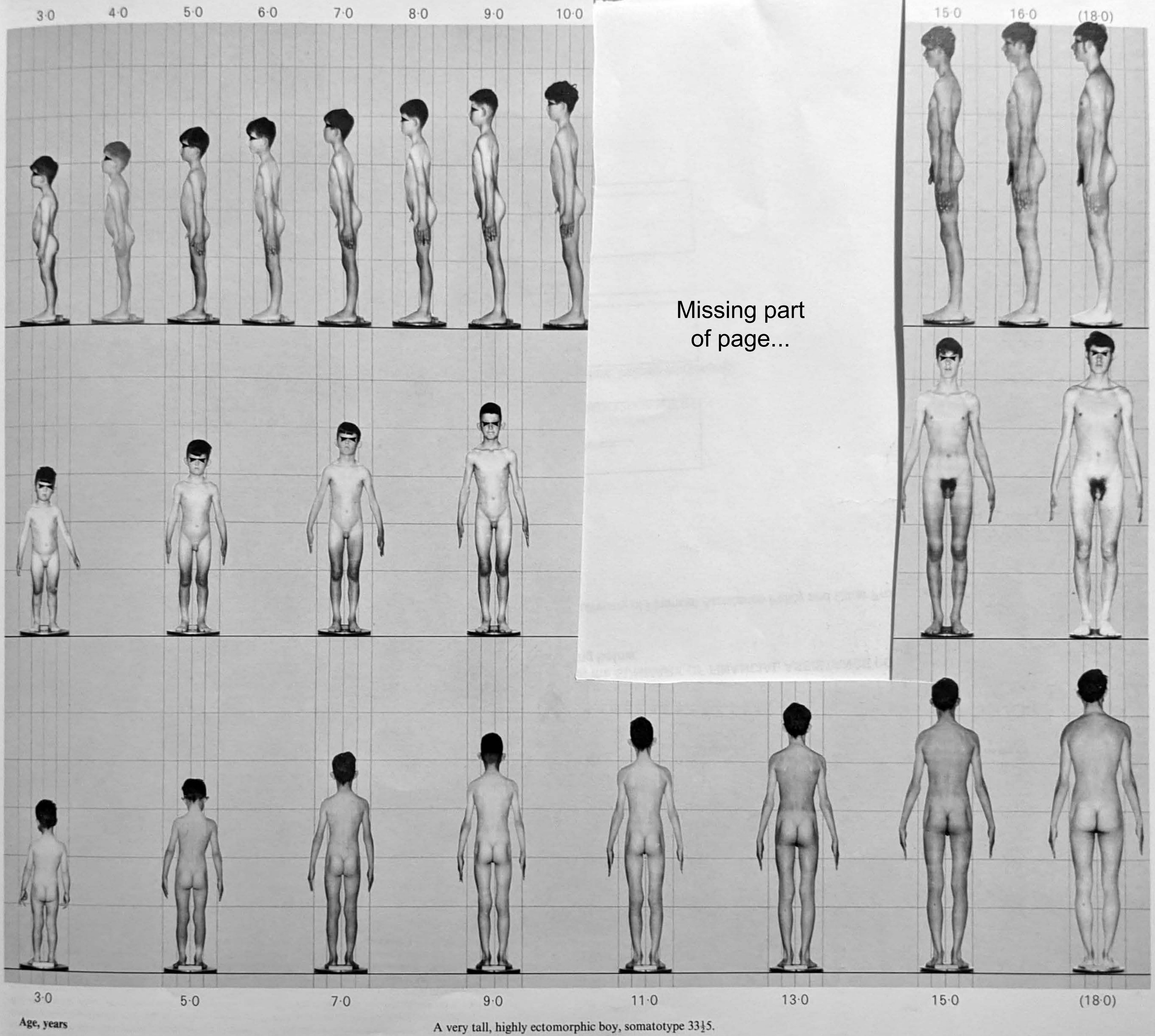
Subject No. 20

A consistently tall boy, somatotype 33½5, with height always a little above the 97th centile. Biacromial and biiliac diameters are around the 97th centile also. Sitting height is a little above the 97th and leg length a little below it. This subject is less lean than most of the ectomorphs we have so far looked at, with triceps skinfold averaging around the 20th centile, and weight ultimately reaching the 90th.

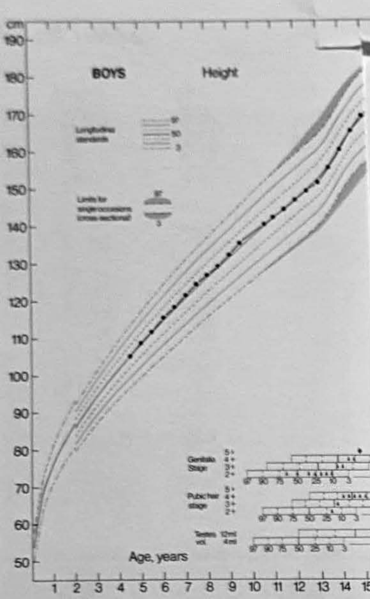
The height velocity curve starts at the 90th centile and gradually falls to the 25th before puberty; the boy's deceleration, therefore, is above average. There is a curious increase of velocity from 6 to 7·5 years which seems to occur in biacromial and biiliac diameters also. The peak height velocity is average in value and is reached at the average time. In this subject sitting height is relatively longer than leg length. The difference between the SD scores starts and ends at −1·0. Leg length velocity peaks a good year and a half earlier than sitting height, a much larger than average interval.

Biacromial diameter is at the 97th centile throughout and biiliac rises from the 90th to the 97th.

The bone maturity score is advanced up till age 14, lying between the 90th and 97th centiles from 3 to 10; after this it falls gradually. Pubic hair development is advanced to the 75th centile; genitalia development, however, occurs on average nearer the 50th.



A very tall, highly ectomorphic boy, somatotype 33½5.



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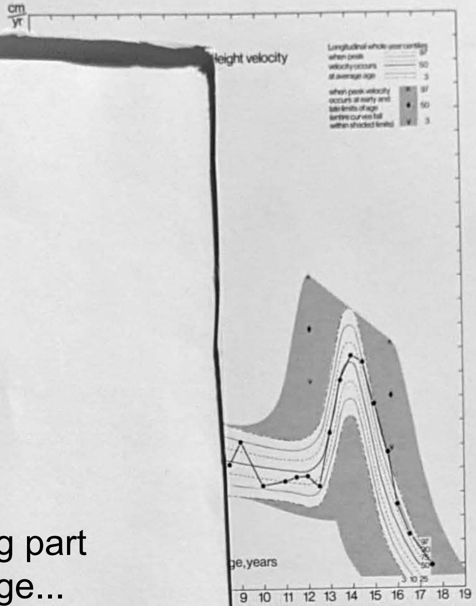
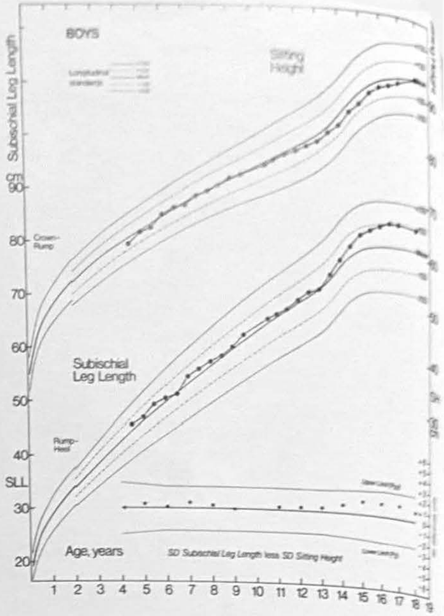
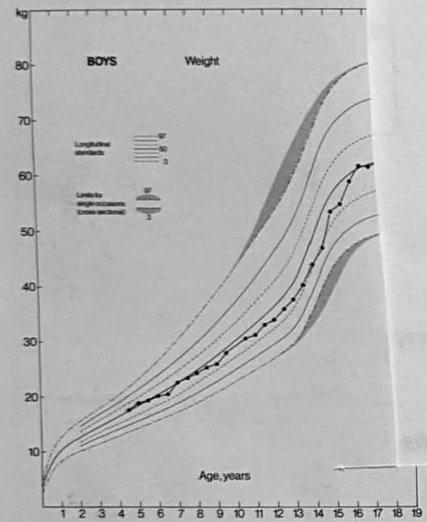
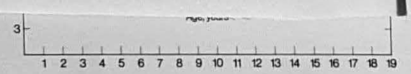
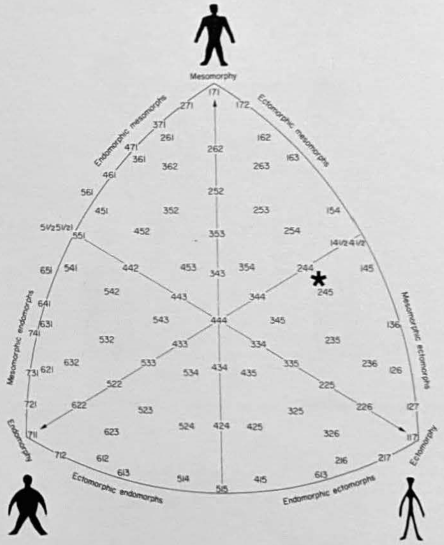
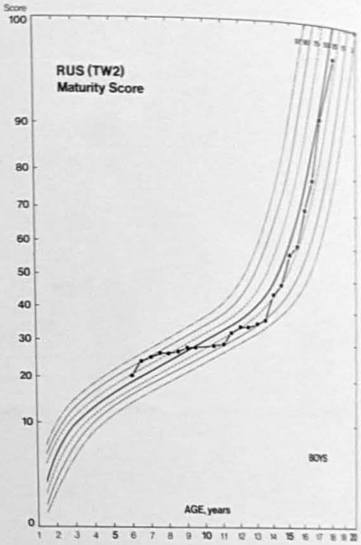


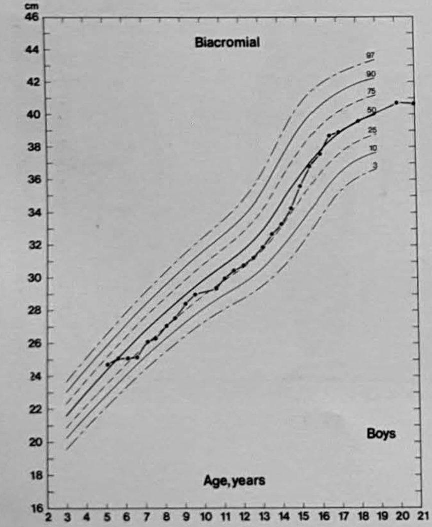


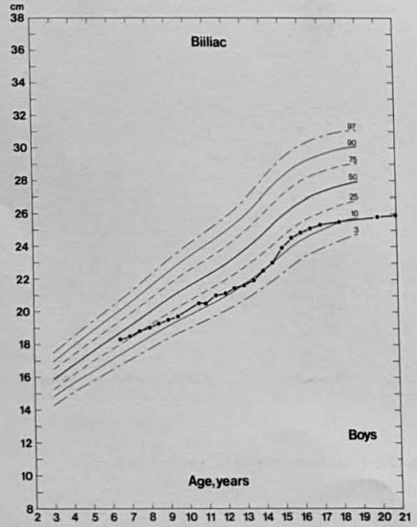












Normal Boy *Subject No. 21*

A typical mesomorphic ectomorph, followed from 4·5 to 18 years. Height is at the 50th centile till puberty, but a larger than average spurt increases it to the 75th at maturity.

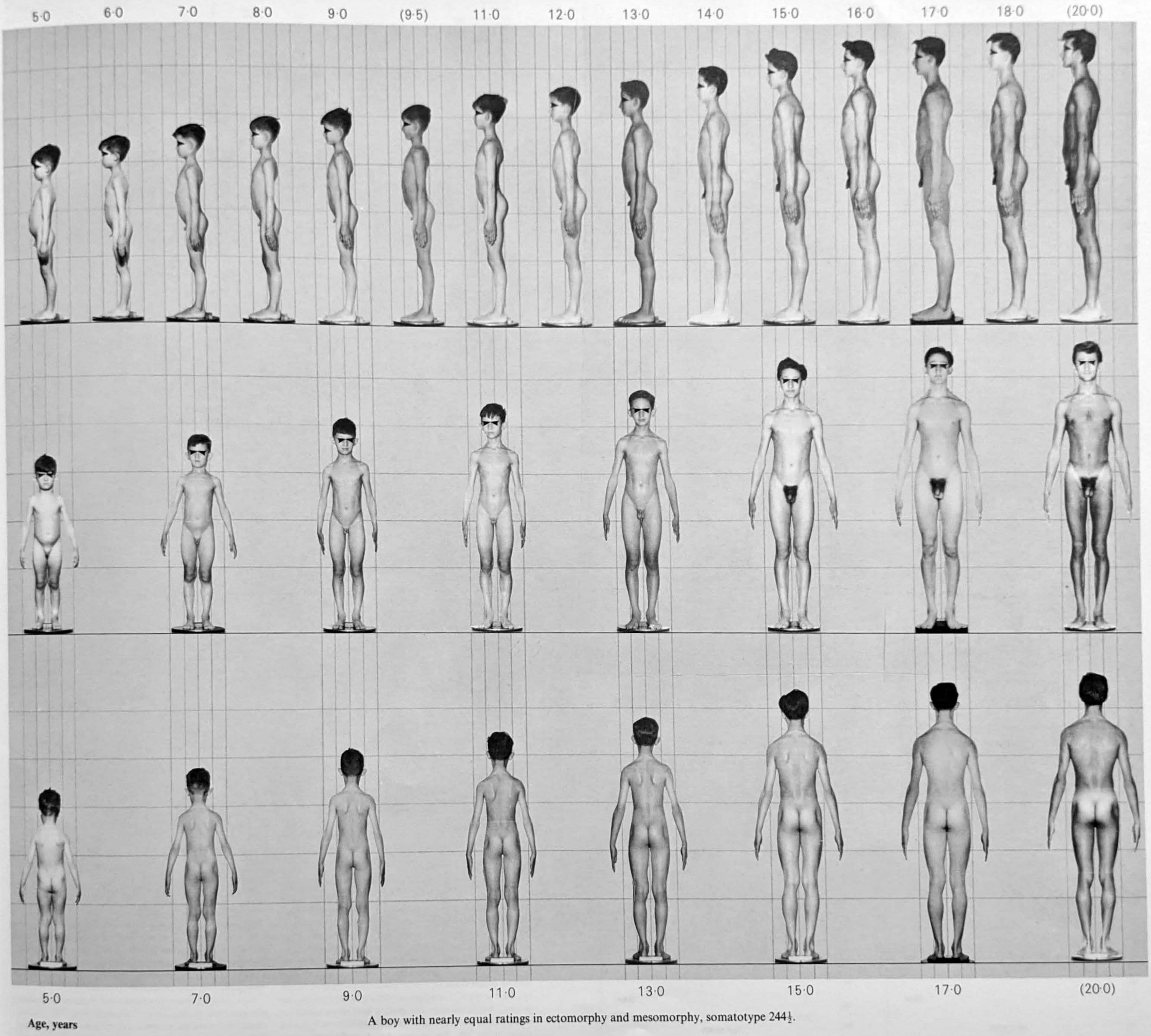
Height velocity shows a small peak from 8·5 to 9·5 due to leg length gain, which seems also to be reflected in biacromial growth, though not in biiliac. Peak height velocity is average and is reached at the average age, but the spurt is more prolonged than usual. Sitting height and leg length are in exact proportion before puberty but leg length in this subject shows a considerably greater spurt than sitting height, as in no. 18. At maturity leg length is +1·0 SD and sitting height 0·0 SD.

Biacromial diameter is at first around the 25th centile and increases to the 50th at puberty, while biiliac diameter remains near the 10th throughout. This subject is an athletically built boy with narrow hips.

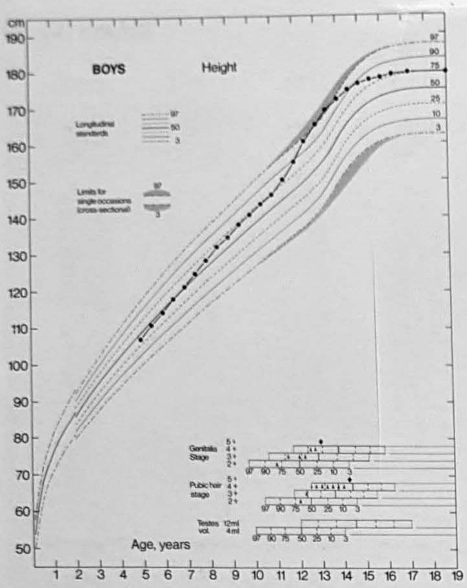
Bone maturity score, at first advanced, decreases in centile from 6·5 to 11 years then stays constant at the 25th centile. Pubic hair development occurs at about the average time (bearing in mind the difficulty of seeing stage 2 hair on photographs) and genitalia development is around a year late (bearing in mind the difficulty of distinguishing stage 2 from stage 1 in these ratings).

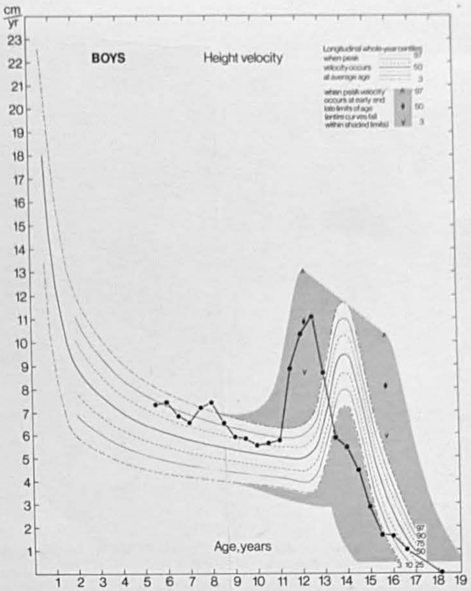
Normal Boy

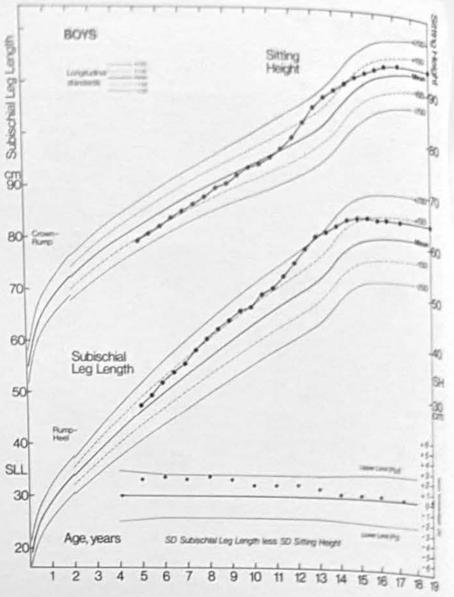
Subject No. 21

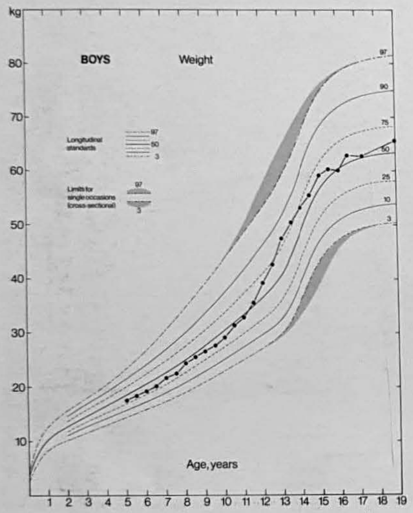


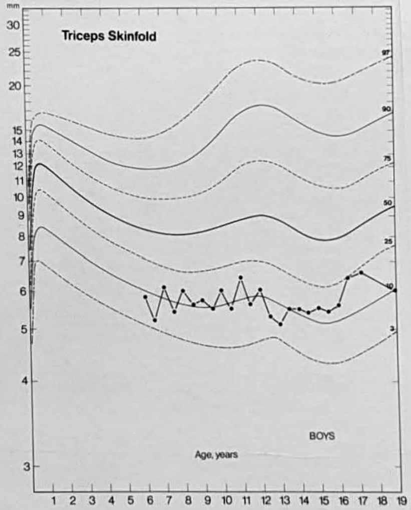
A boy with nearly equal ratings in ectomorphy and mesomorphy, somatotype 244½.

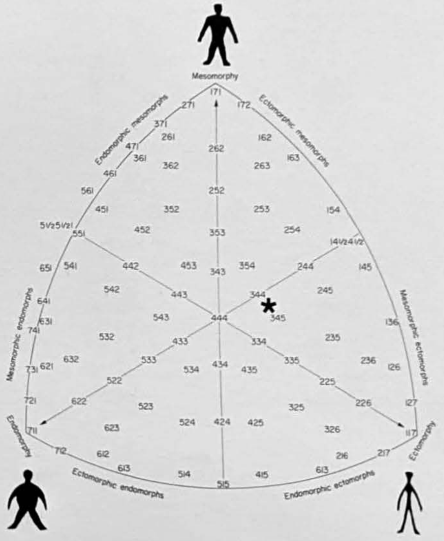


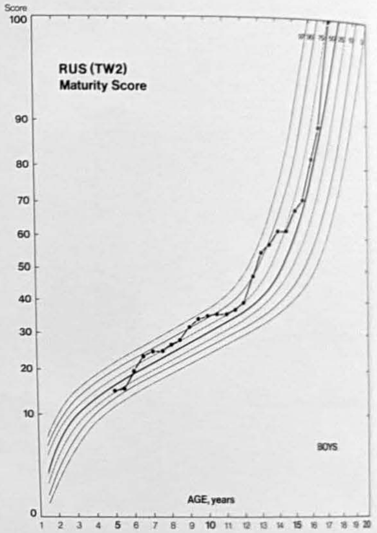


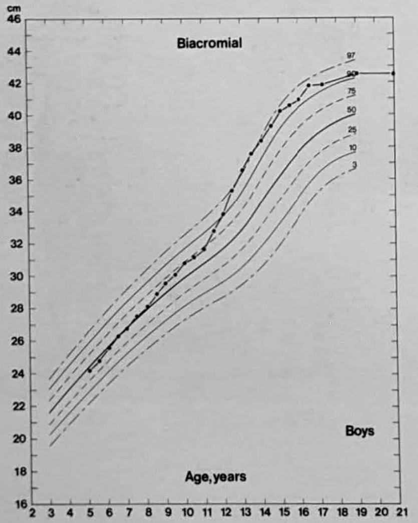


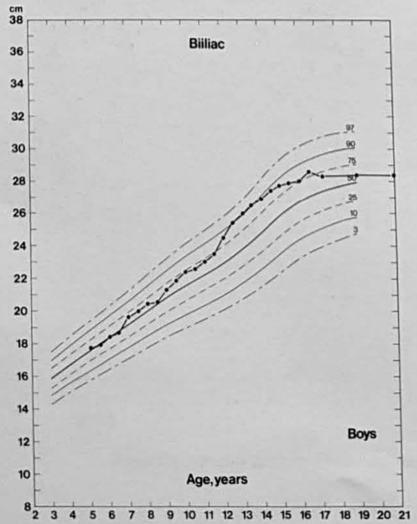












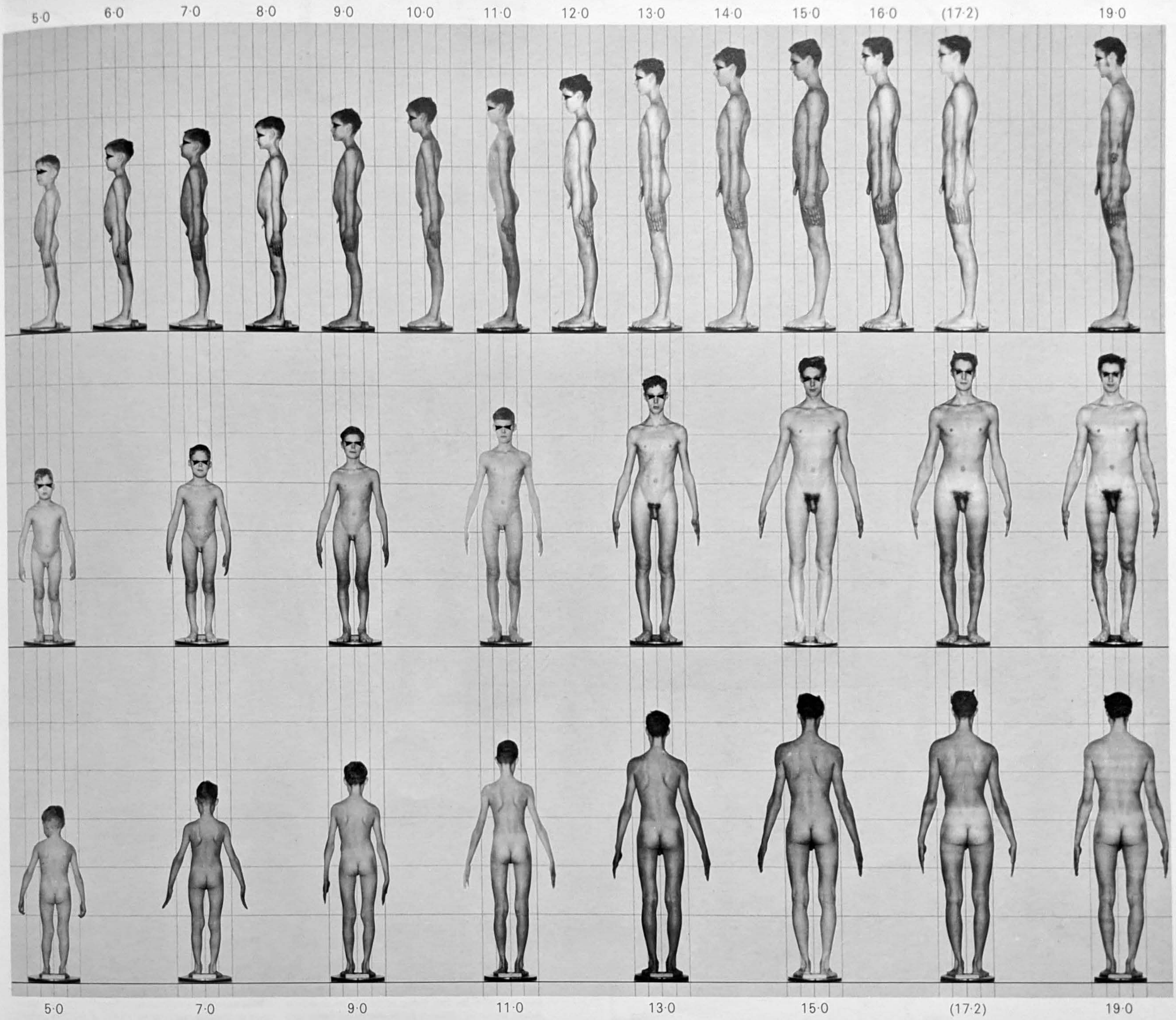
Normal Boy

Subject No. 22

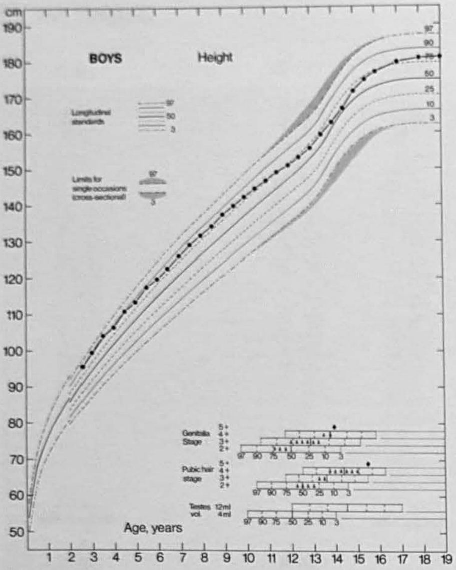
Another mesomorphic ectomorph, but with more endomorphy than the preceding subject. This boy has a very early spurt, which takes his height from the 75th to the 97th centile and back again. Before puberty, however, the height velocity has been much above average (about the 90th centile) so this subject progresses in height from the 30th centile at age 5 to the 75th centile at age 11, a quite unusual type of curve. Indeed of all our subjects, this is the one with the highest overall pre-pubertal height velocity. The spurt is seen about equally in sitting height and leg length, with the peak about 6 months earlier in the legs. The legs are at first considerably above average length for the size of trunk, but by the end of puberty proportions are exactly average.

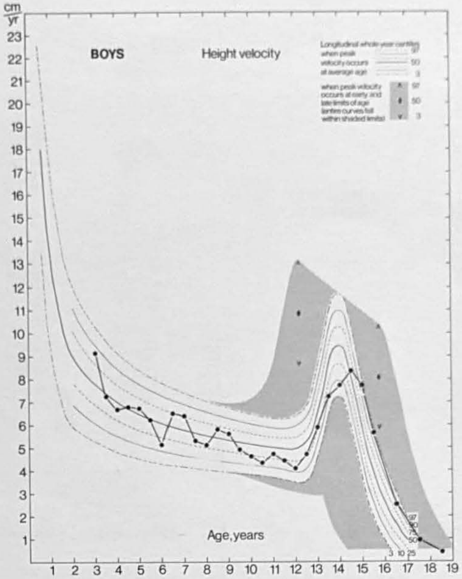
Biacromial diameter shows an exactly similar curve to height, rising from the 40th to the 75th centile between 5 and 11, and then reaching the 97th. Biiliac diameter shows a much lower velocity, rising only slightly through the centiles before puberty. It ends at the 50th as does, approximately, weight. Triceps skinfold stays around the 10th centile.

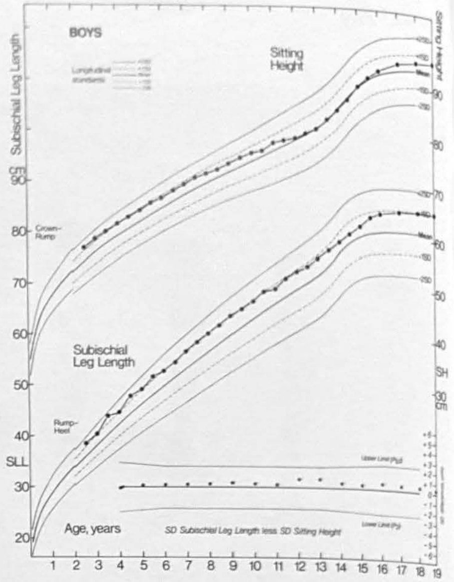
Bone maturity score, like height and biacromial diameter, increases from the 40th to the 75th centile from 5 to 11 years; thereafter it remains at about the 75th. Both genitalia and pubic hair develop early, in accord with the height spurt and the bone maturity score.

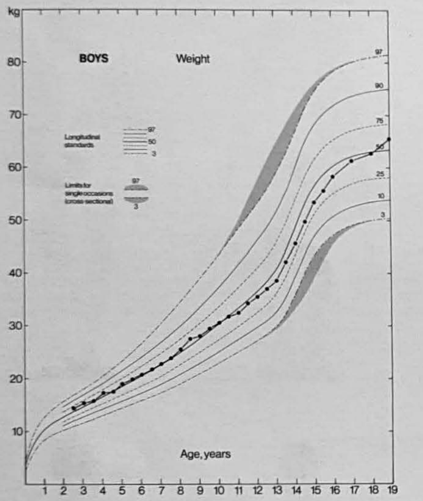


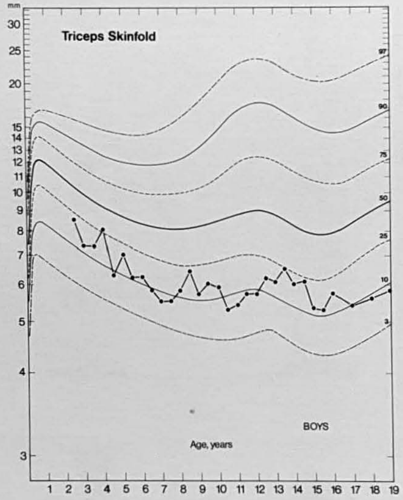
A tall mesomorphic ectomorph, somatotype 344½, with a very early adolescent growth spurt.

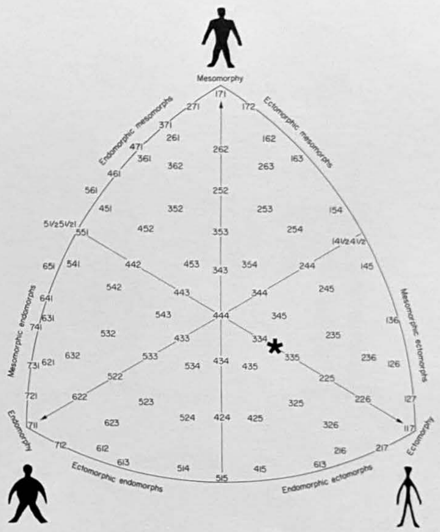


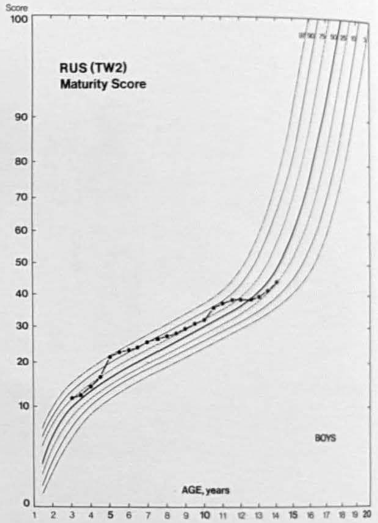


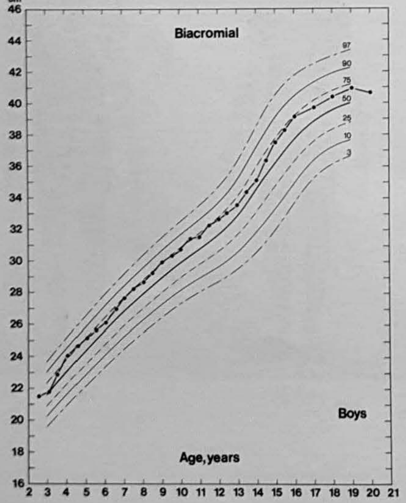


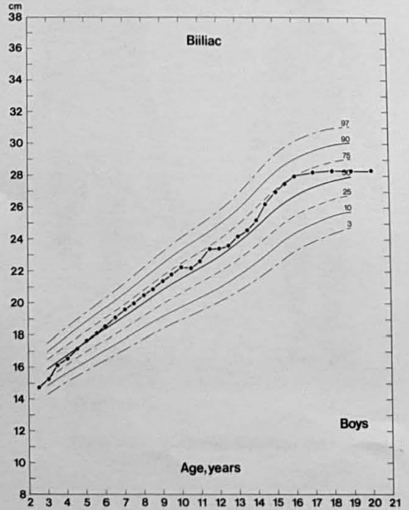












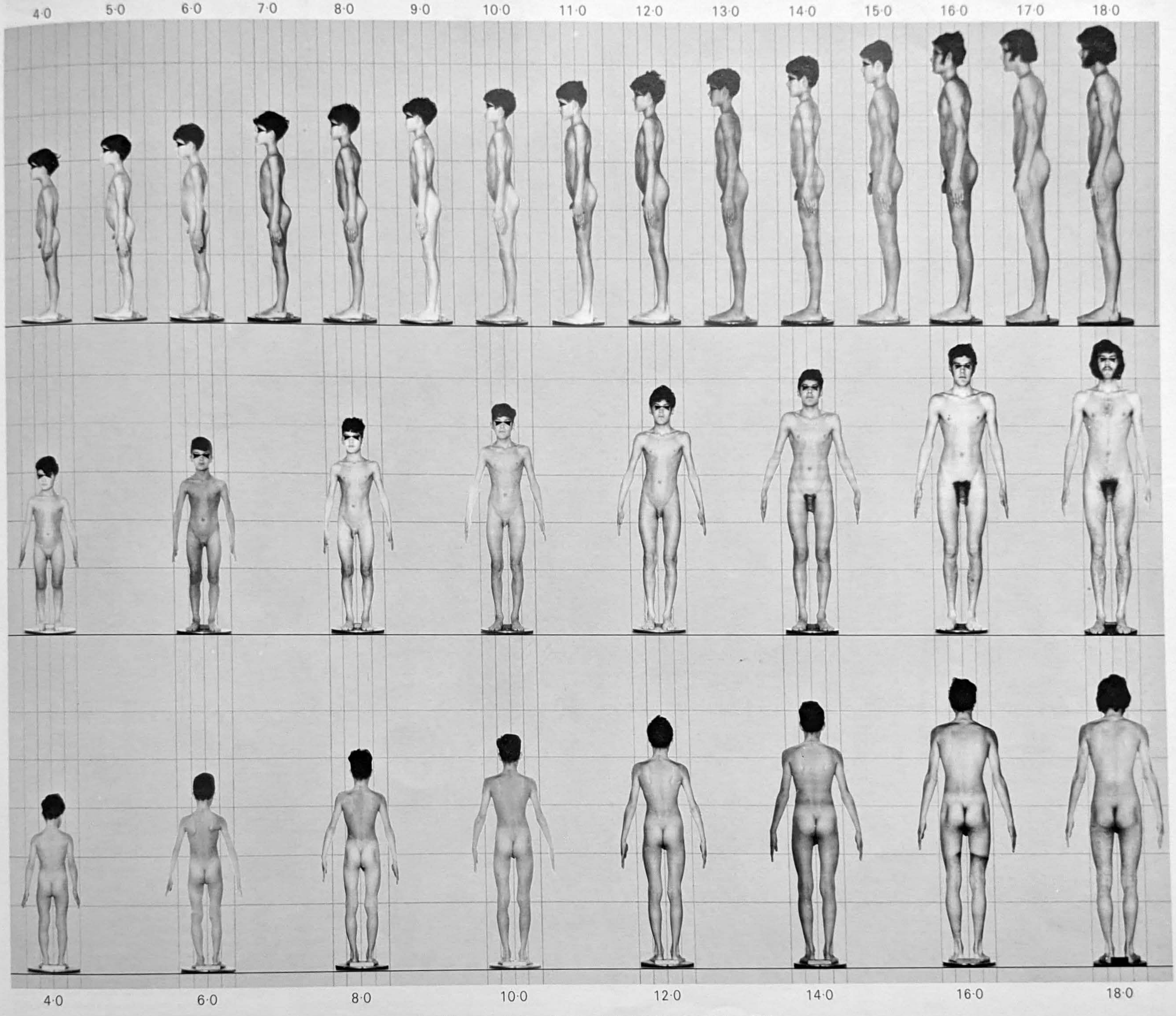
Normal Boy

Subject No. 23

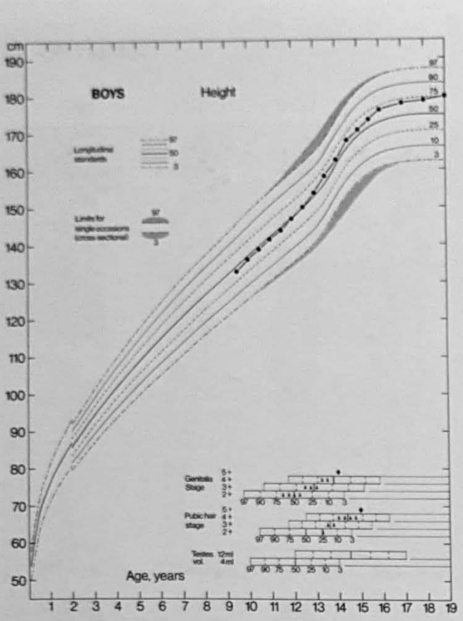
This is the last of our predominantly ectomorphic group, and the subject followed from the earliest age amongst them. The height curve is very steady, the centile gradually reducing from the 90th to the 75th, falling to the 50th temporarily at puberty because of a late peak height velocity and rising again to end at the 80th. The height velocity curve is not specially remarkable; the peak reaches the 25th centile, some 6 months later than average. Sitting height and leg length are in near-average proportion, with leg length a trifle higher at maturity.

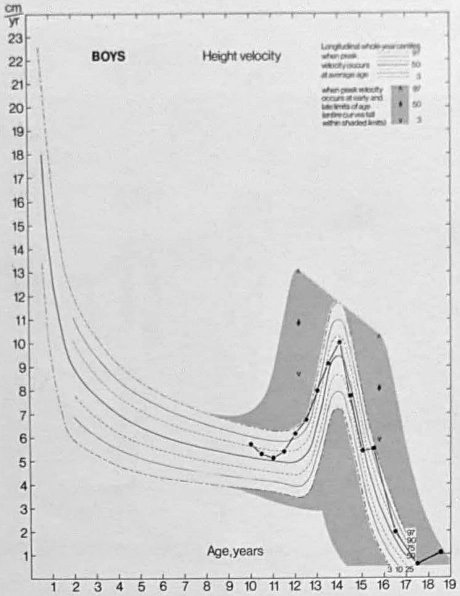
Biacromial diameter stays at about the 75th throughout and biiliac between the 50th and 75th. Triceps skinfold averages about the 15th centile and follows a very consistent course.

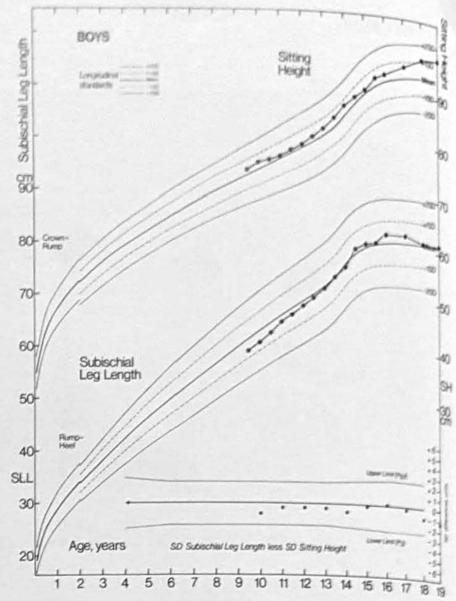
Bone maturity is a little advanced from 5 to 12 years, but it has a decelerating curve, so by 14 it is at the 25th centile. Genitalia and pubic hair stages are unusually early in comparison with peak height velocity and bone maturity. The genitalia stages are reached at about 6 months earlier than average, and the pubic hair stages at the average time.

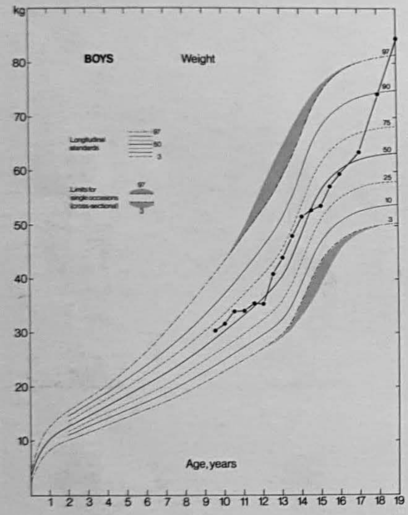


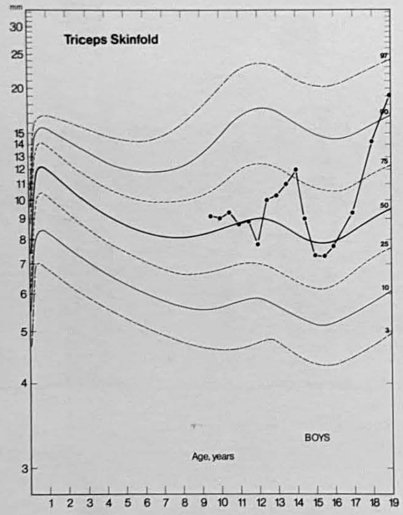
A tall boy of predominantly ectomorphic physique, somatotype 334½.

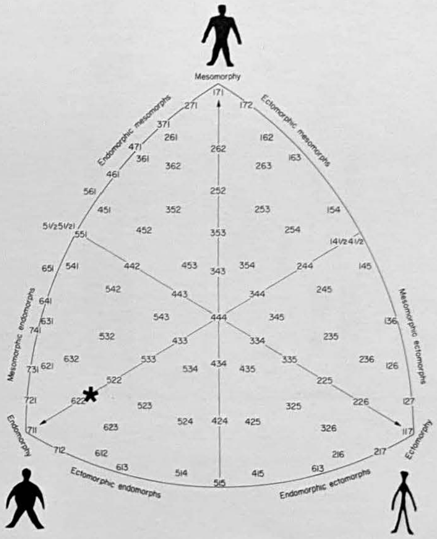


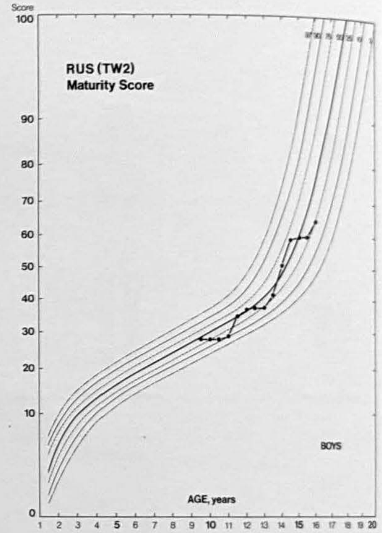


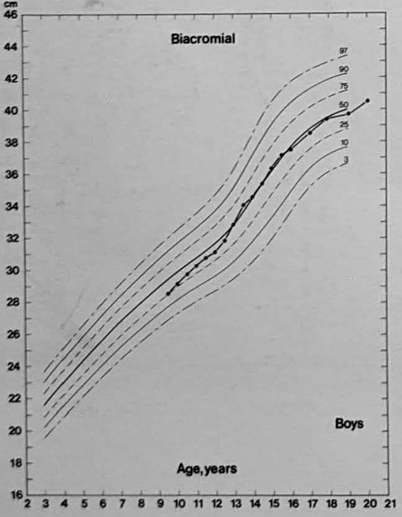


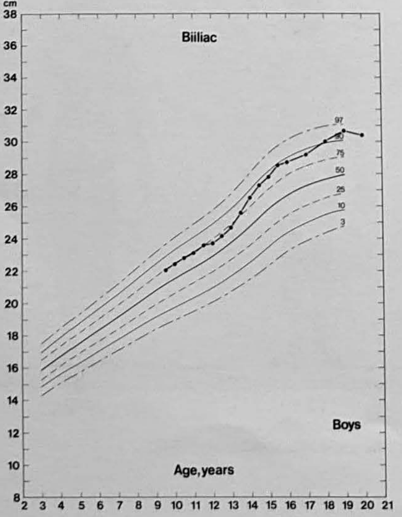












Normal Boy *Subject No. 24*

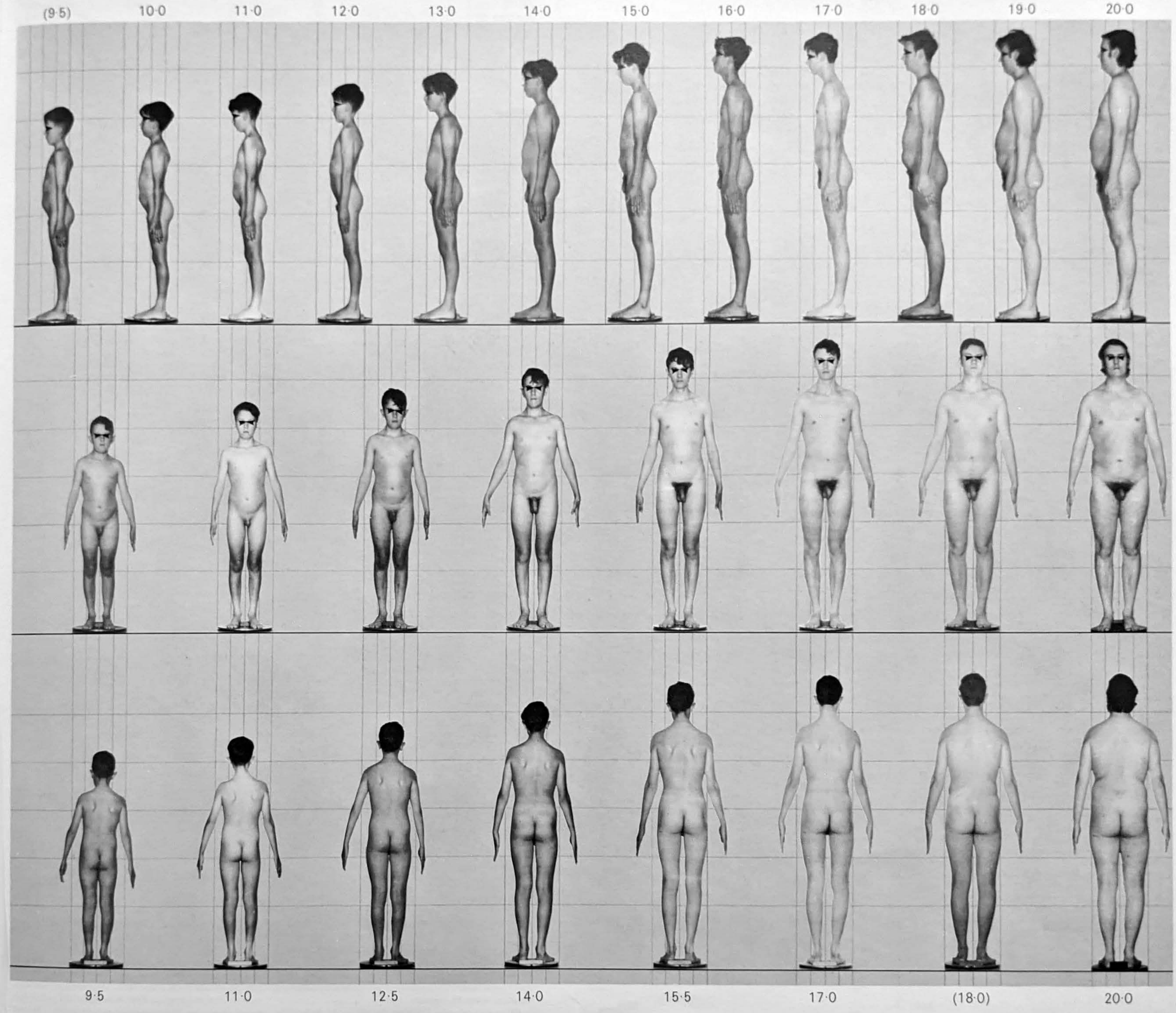
We have rather few boys who are high in endomorphy and this subject and the following one are alone in having ratings of 6 units (we have none with 7). This subject has a typically endomorphic physique. Height rises rather gradually from the 50th to the 75th centile, with peak height velocity reaching the 75th centile at exactly average time. The duration of the spurt is also well above average.

Sitting height is throughout relatively greater than leg length, which is characteristic of subjects high in endomorphy. Initial and final differences in SD scores are about the same and approximate −1 SD.

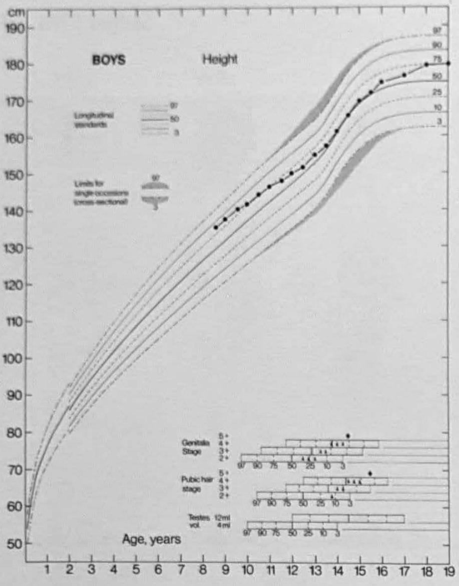
Biacromial diameter rises gradually from the 25th to the 50th centile and biiliac from the 75th to the 90th. Weight remains at the 50th centile from 9·5 to 16 but then takes off to above the 97th centile, accompanied by the triceps skinfold, which earlier had fallen during puberty in the usual way.

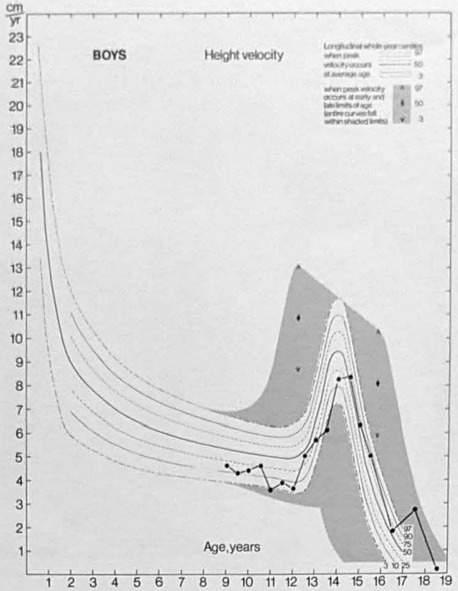
Bone maturity score remains about average. Genitalia and pubic hair stages occur at around the average times.

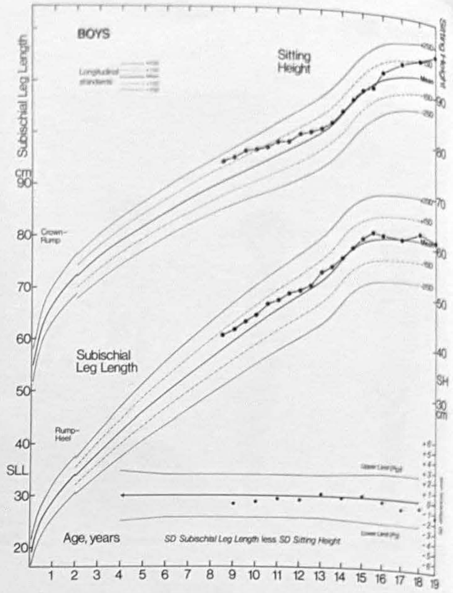
The pictures show how deceptive a physique may be and how hard it is to see latent endomorphy at certain ages. At 11 years, the chubby build is obvious enough, and at 18 years also. At 15·5, however, the subject looks quite slim and only the fullness of the abdomen and chest, the thinness of the neck in relation to head and shoulders and the slight "hamming" of the upper arm and thigh betray the underlying endomorphic tendency.

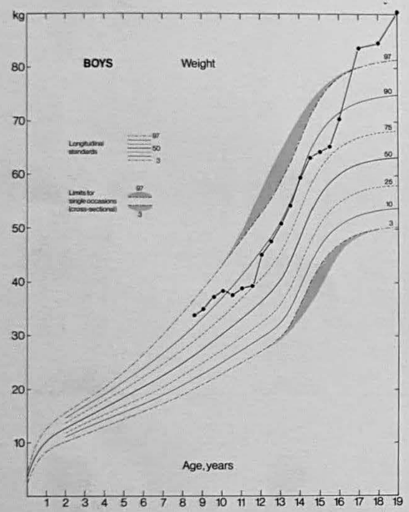


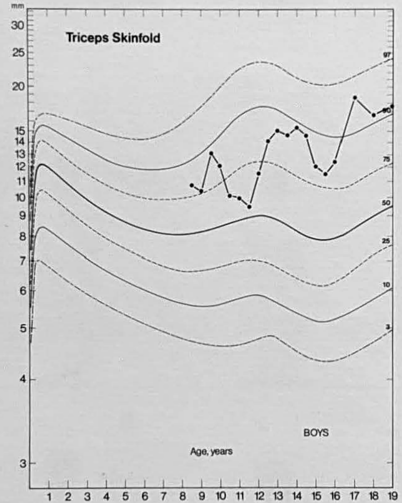
A predominantly endomorphic boy, somatotype 62½2½.

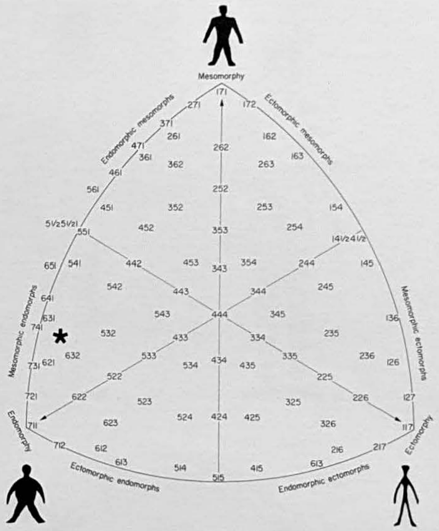


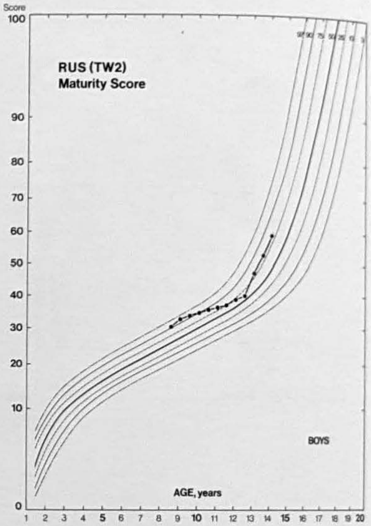


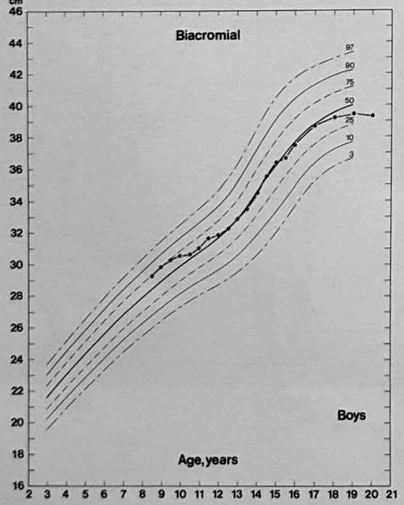


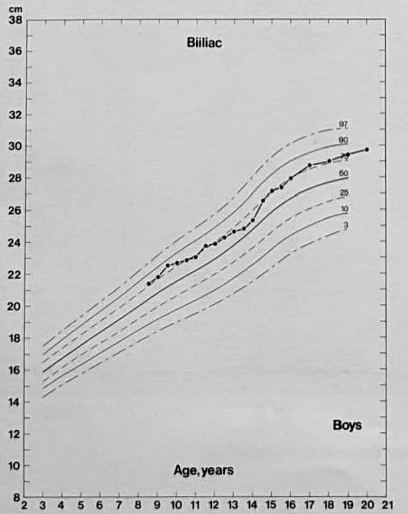












Normal Boy

Subject No. 25

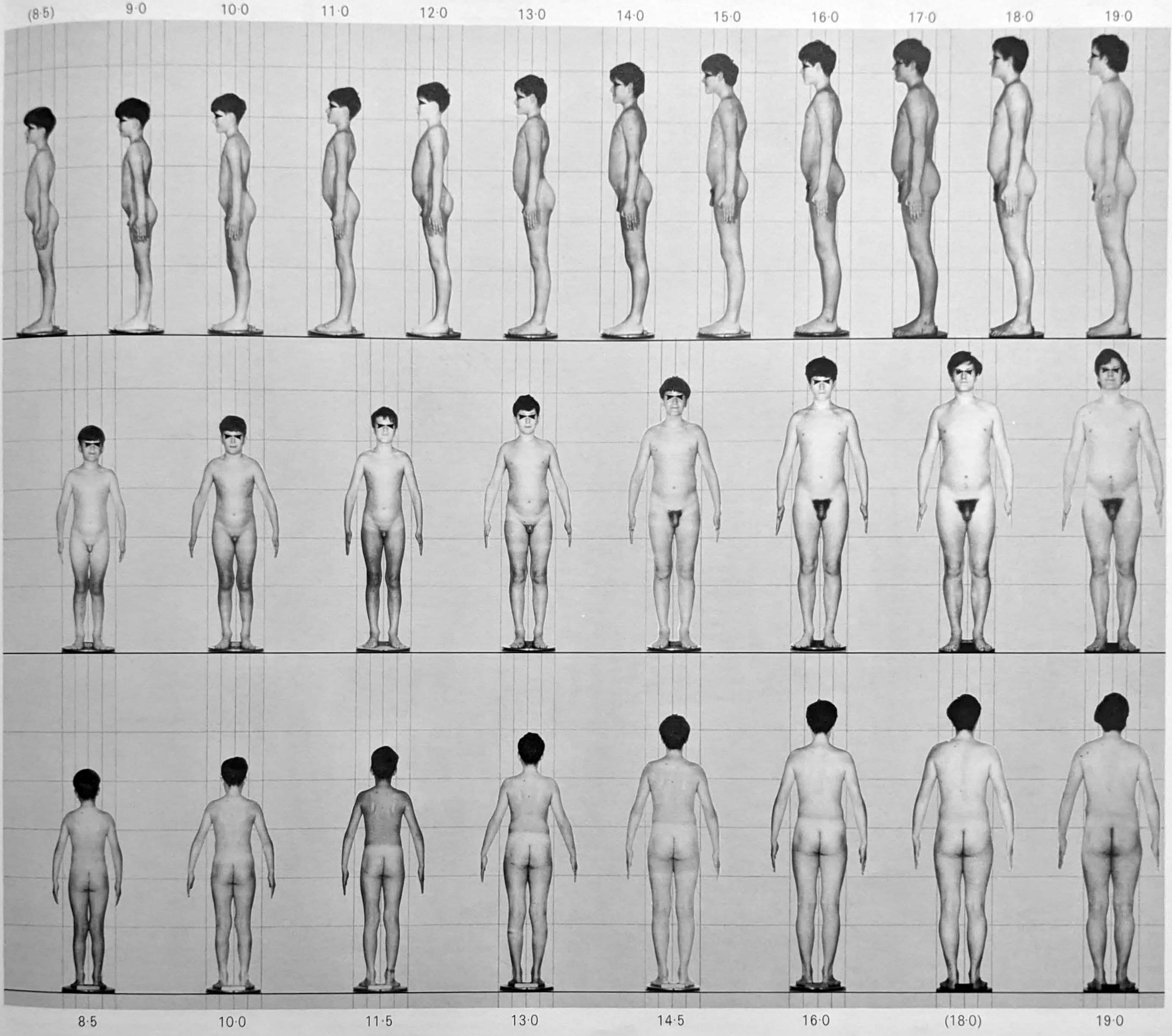
A highly endomorphic boy, somatotype 631½. Height is initially and finally at the 75th centile, falling to the 50th at puberty because of a relatively late spurt. Peak height velocity is at the 25th centile. Sitting height and leg length are in about average proportion till puberty, when sitting height has a much greater spurt. The last few values are probably influenced by excess fat on the buttocks.

Biacromial diameter falls from the 75th to the 40th centile and biiliac stays throughout at the 75th. Weight is mostly at the 90th centile but increases rapidly to obesity levels after age 16. Triceps skinfold, around the 90th centile before puberty, falls to the 75th during the growth spurt and then rises again to the 90th. Much of this subject's late weight gain has evidently gone into the abdominal fat depots and not the limbs.

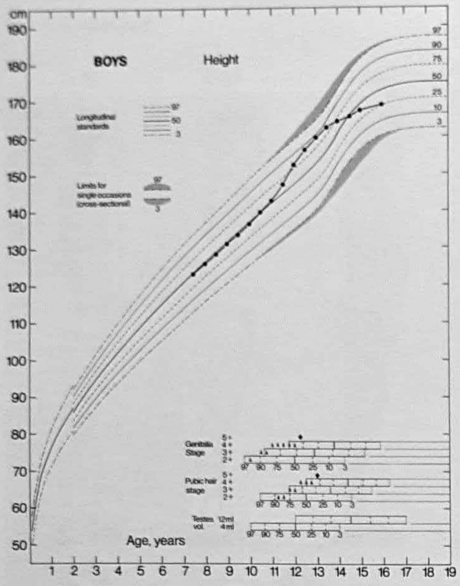
Bone maturity score is somewhat advanced, averaging the 75th centile. In contrast pubic hair stages are reached quite late, on average at the 25th centile. Genitalia stages are also reached later than average. Both these agree with peak height velocity therefore; it is the skeletal maturity which is the odd one out.

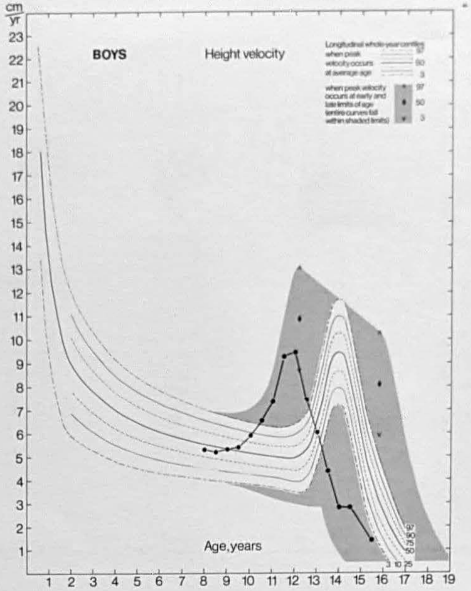
The pictures show a very "constant" physique with endomorphy always explicit.

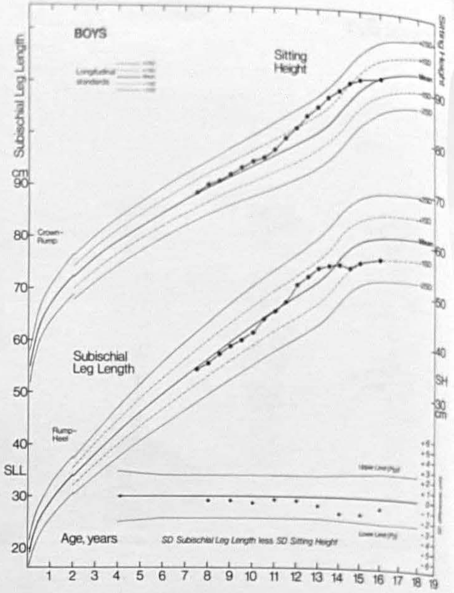
Subject No. 25

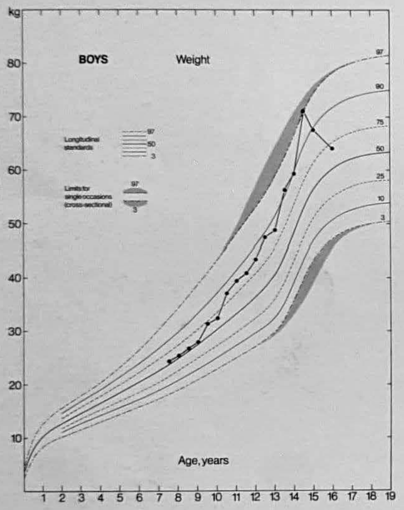


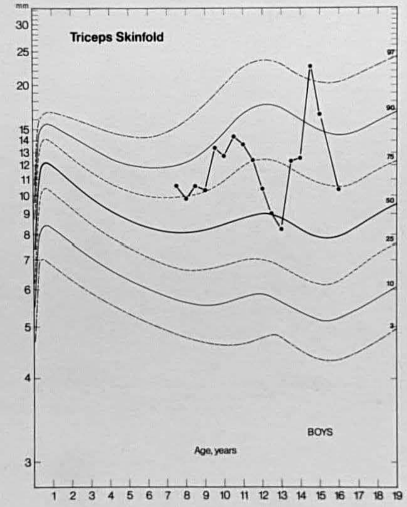
A highly endomorphic boy, somatotype 631½.

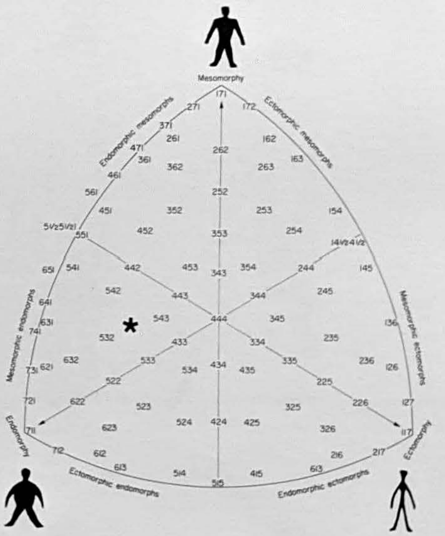


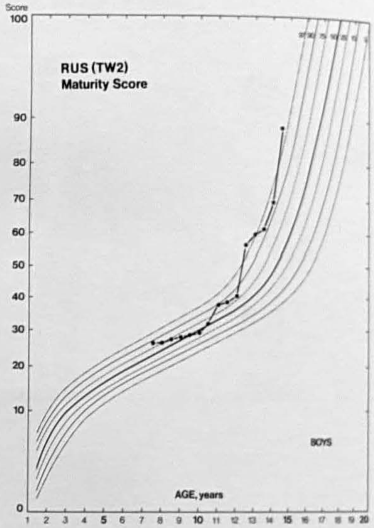


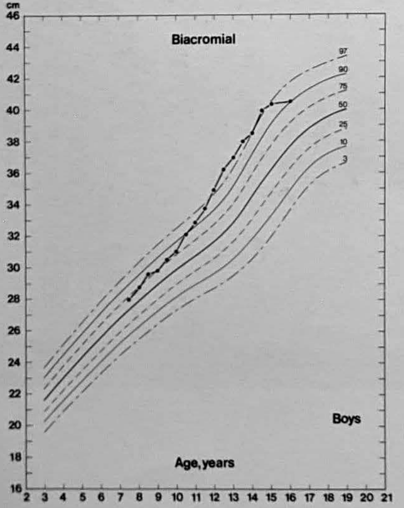


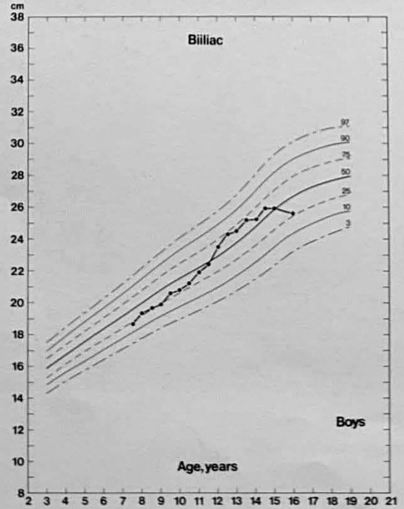












Normal Boy *Subject No. 26*

The last of our fairly extreme endomorphs, somatotype 53½2½. He is very early maturing, with peak height velocity at age 12, the early limit of normal. The spurt carries his height from the 50th to the 90th centile, but it ends at the 25th. As in the other high endomorphs, sitting height is relatively greater than leg length, particularly after puberty. Leg length, after rising in the spurt from 0·0 to +0·8 SD, falls back to −1·0 SD. Sitting height starts and ends at 0·0 SD.

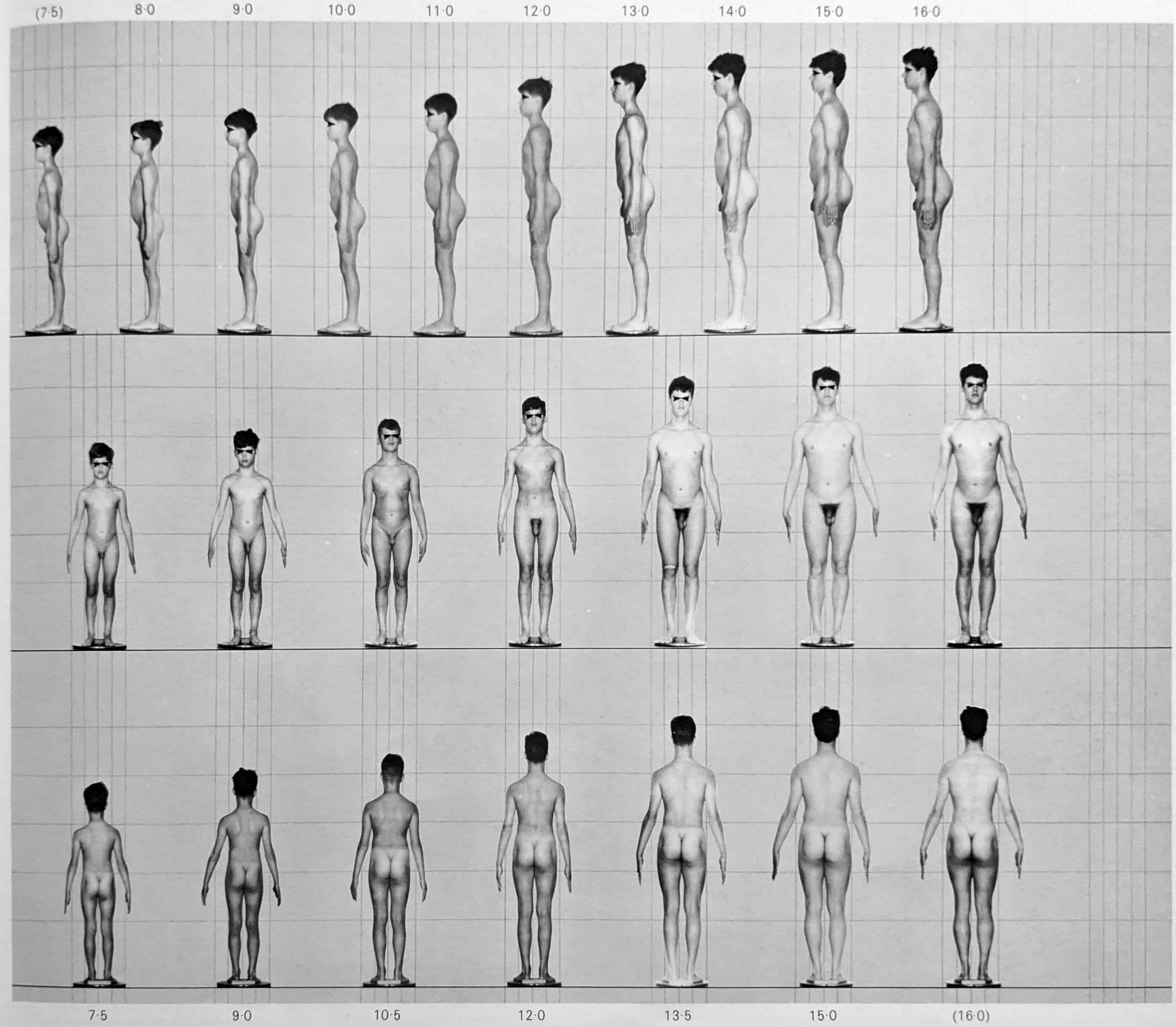
Biacromial diameter, like height, is carried from the 75th to above the 97th at ages 12 to 14, but ends at about the 60th. Biiliac begins and ends at the 25th.

Weight is at first at the 50th centile, but starts rising at age 9 and continues till it hits the 97th centile at 14·5 after which determined dieting brings it down again to the 75th. The triceps skinfold reflects the same events.

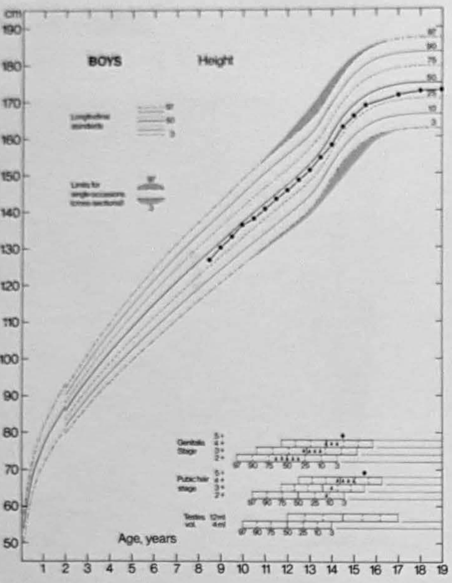
Bone maturity score is ahead of average at first, but advances slowly till 10, when it speeds up greatly, to reach the 97th centile by 12·5, thus agreeing with the early height spurt. Genitalia and pubic hair also develop very early.

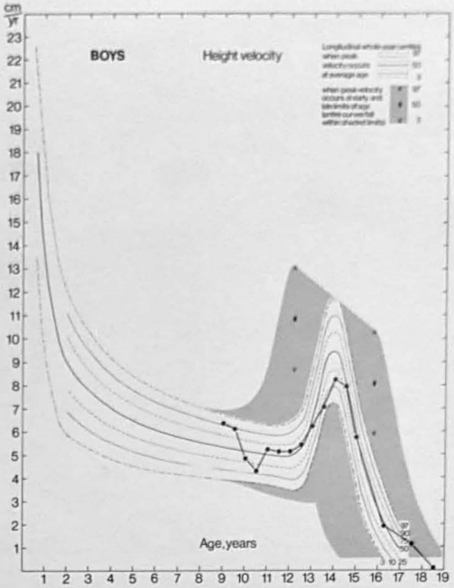
The pictures show again a consistently endomorphic physique, not seriously dissimulated by the loss of fat in puberty or the post-adolescent dieting period.

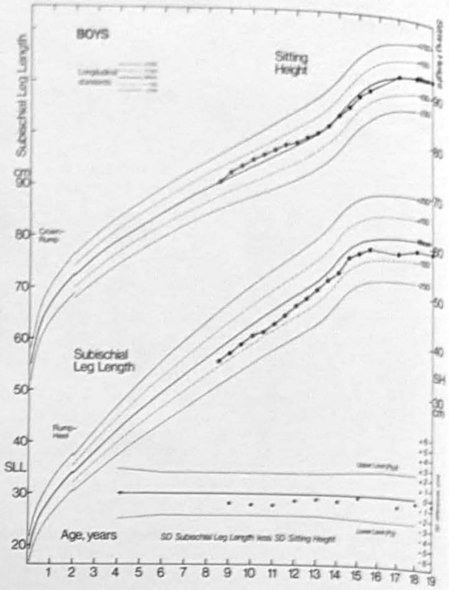
Normal Boy *Subject No. 26*

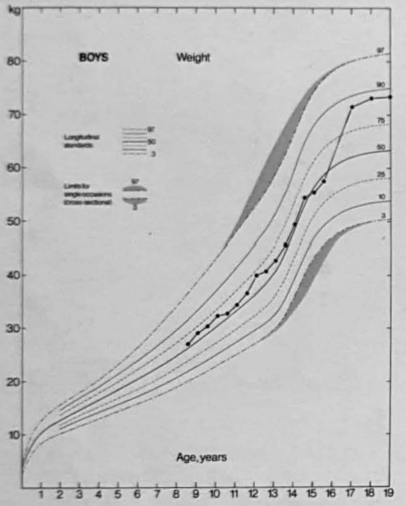


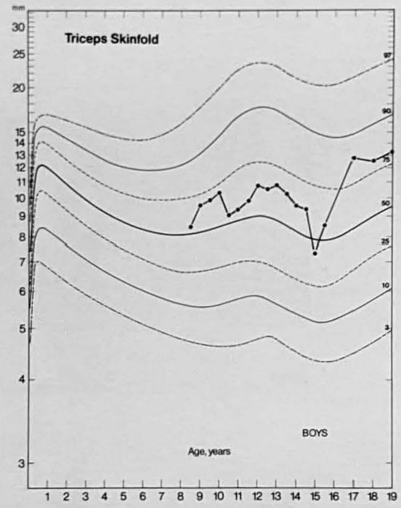
A very early-maturing, predominantly endomorphic boy, somatotype 53½2½.

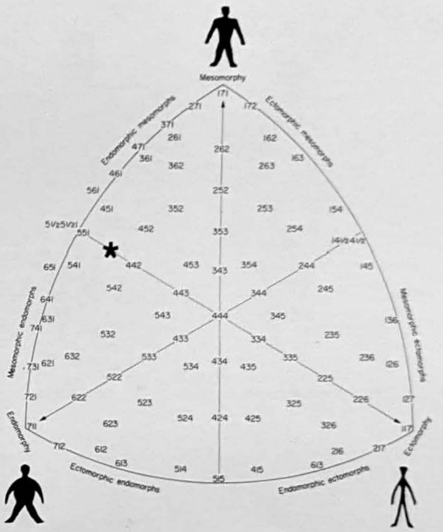


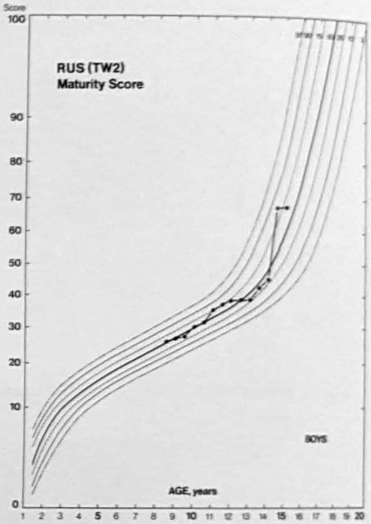


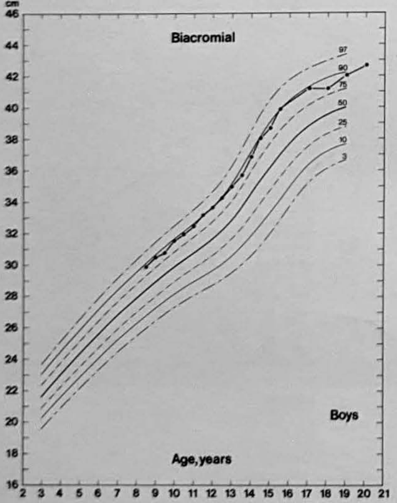


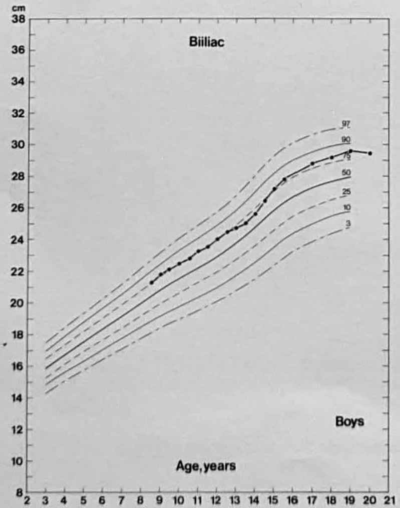












Normal Boy

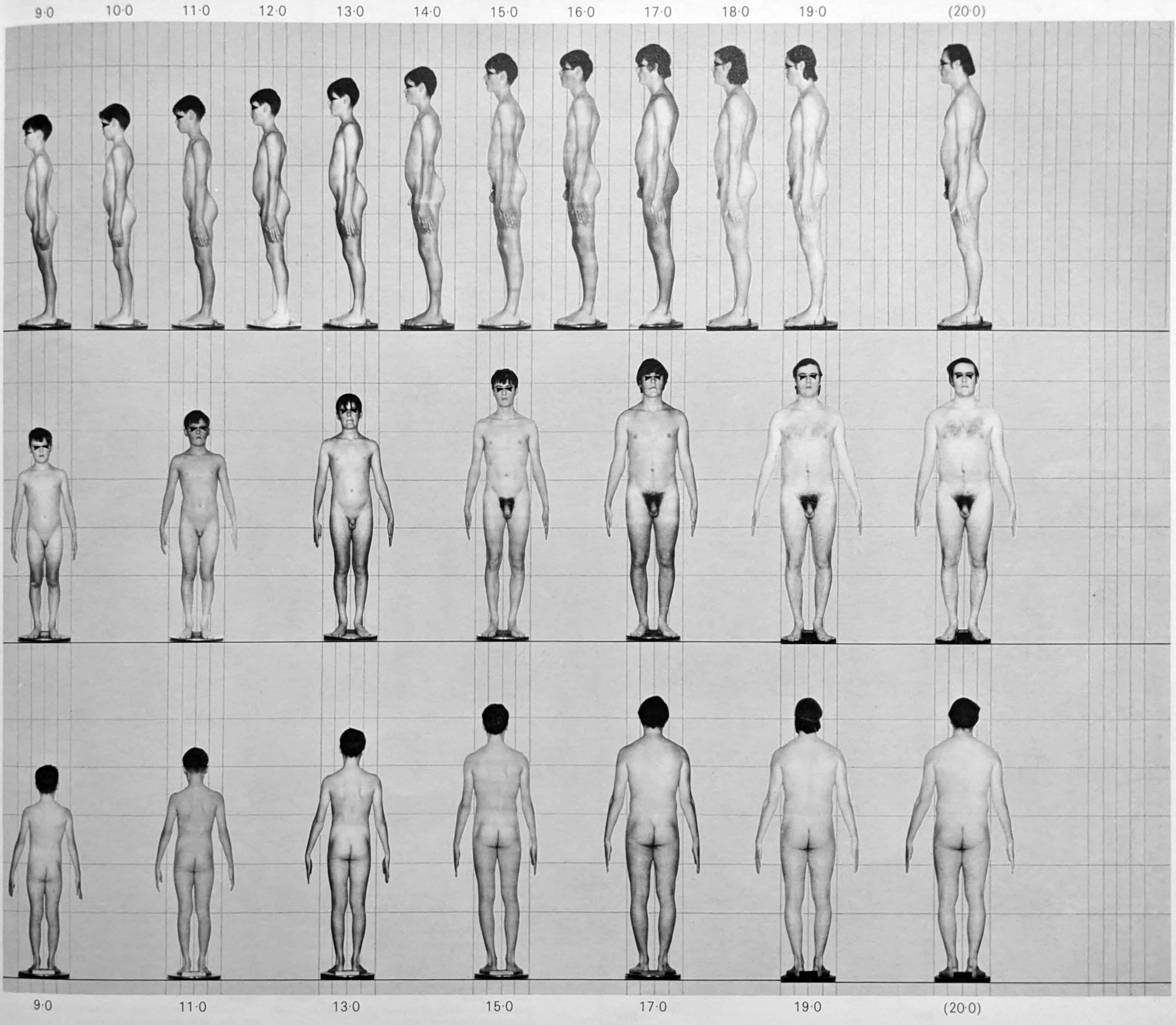
Subject No. 27

A boy equally high in endomorphy and mesomorphy, somatotype 4½4½1½, of average size. Height is between the 25th and 50th centiles throughout and peak height velocity reaches the 15th centile at just the average time. Sitting height is at the 50th centile throughout, and leg length around the 35th. Biacromial diameter is high, at the 90th centile throughout; biiliac is at the 75th.

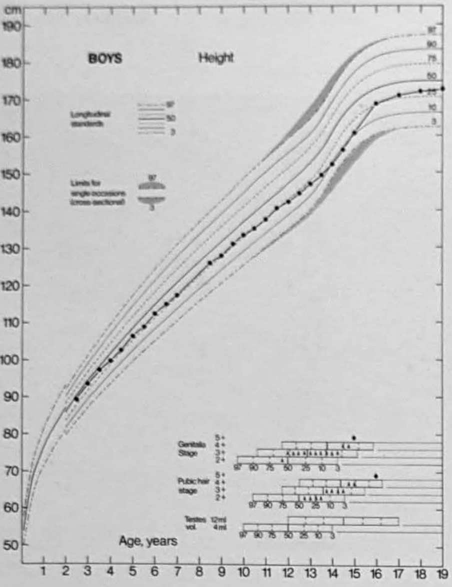
Weight is at about the 60th centile till age 16 when it increases sharply to the 80th centile, as in many boys high in endomorphy. Triceps skinfold follows the usual curve, at about the 60th centile level, till age 16, when, like weight, it rises sharply.

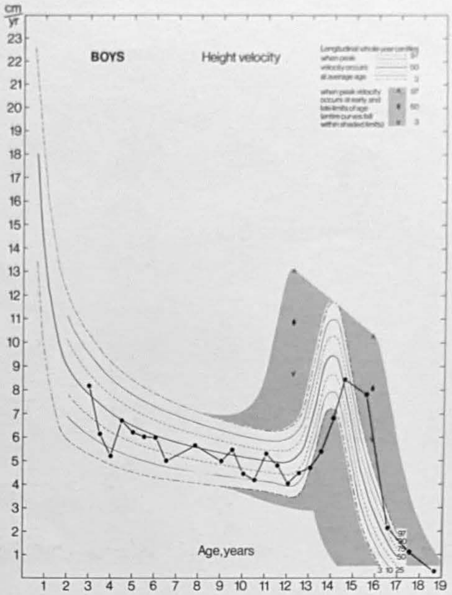
The bone maturity score is around the 50th centile throughout. Genitalia and pubic hair stages are reached at about the average ages.

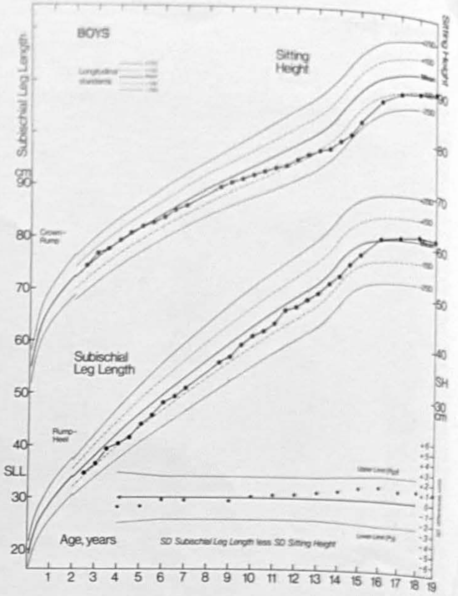
The pictures show clearly the problem of a young man high in endomorphy; the contrast between the physique at 15 and 19 is striking.

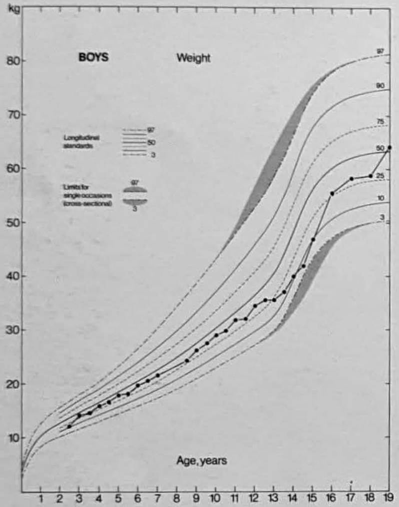


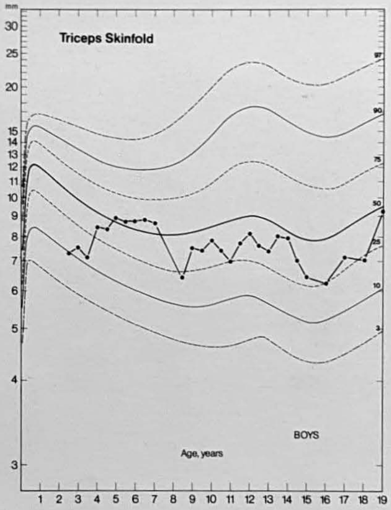
A boy equally high in endomorphy and mesomorphy, somatotype 4½4½1½.

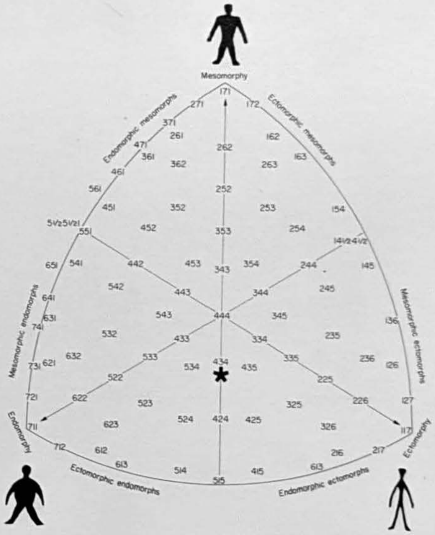


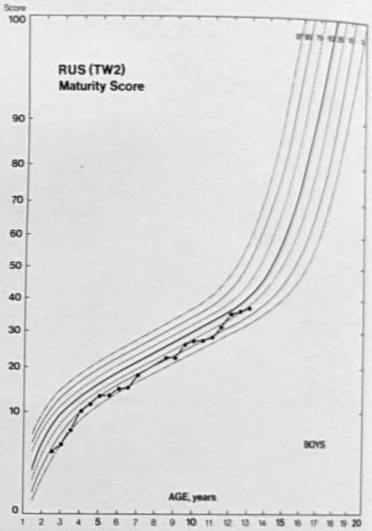


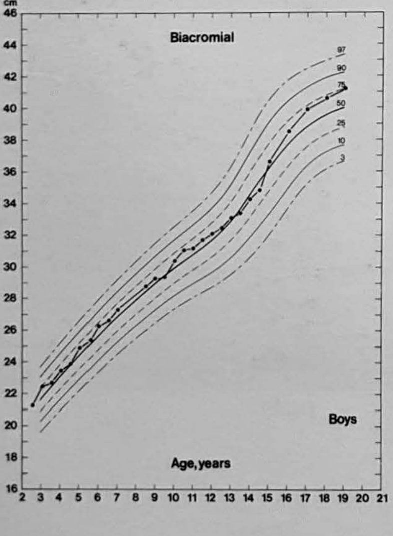


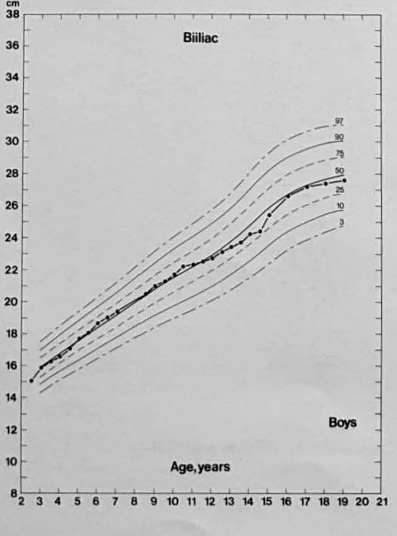












Normal Boy

Subject No. 28

A boy equally high in endomorphy and ectomorphy, but low in mesomorphy, somatotype 434. Height is at about the 30th centile from age 2·5 till 13, then drops to the 10th to rise again to the 30th during a late puberty. Peak height velocity is located about a year later than average, but reaches close to the average value.

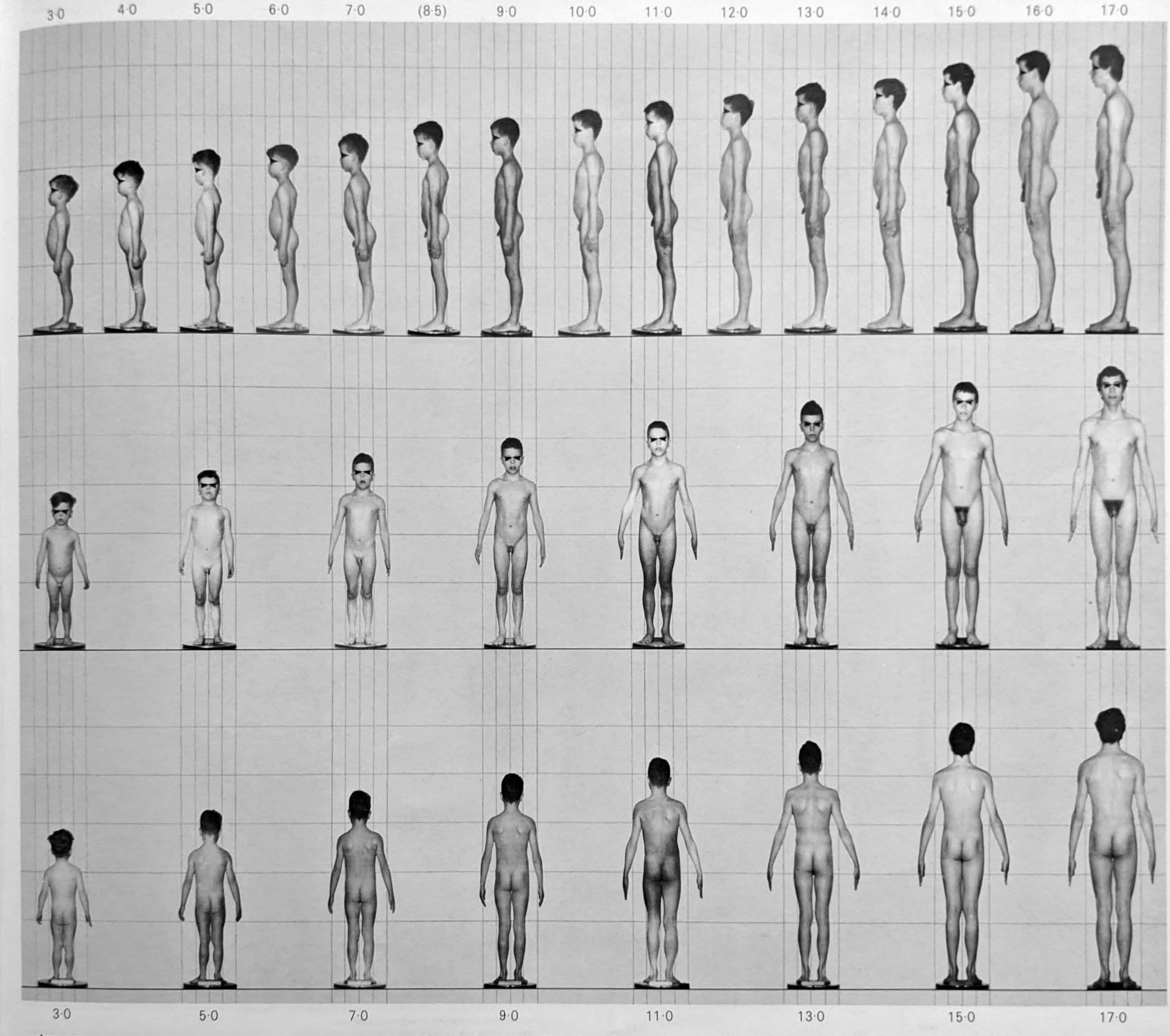
Sitting height and leg length show a gradual reversal in proportion. In the pre-school years sitting height is at 0·0 SD and leg length at −1 SD; at 10–11 years they have equal SD scores and at maturity sitting height SD has fallen to −1 and leg length SD increased to 0·0.

Biacromial diameter is at about the 60th centile from 2·5 to 13 years, drops a little and then increases to the 75th. Biiliac diameter starts and ends at the 50th.

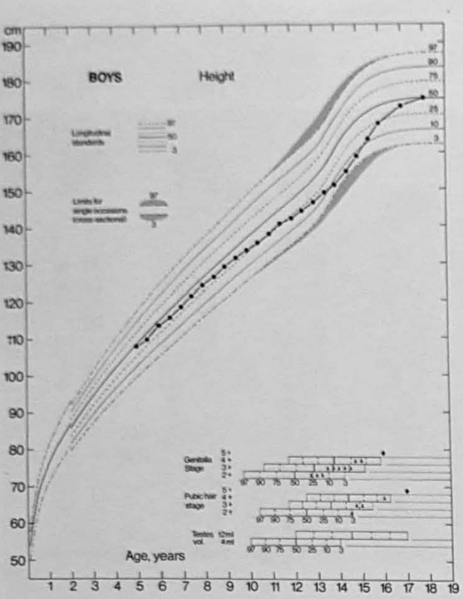
Weight lies around the 30th, like height, till age 13 and follows the height centile throughout puberty. Only at the last examination, at 19, has it started to rise. The triceps skinfold, around the 30th during childhood, falls during puberty, then rises sharply at the last examination, like weight.

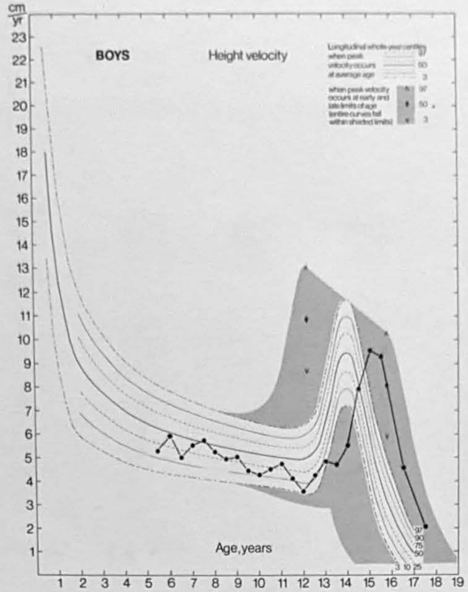
Bone maturity is considerably delayed, with scores between the 3rd and 10th centiles till about 11 years when it increases to the 25th. Genitalia and pubic hair stages are reached a little less than a year late.

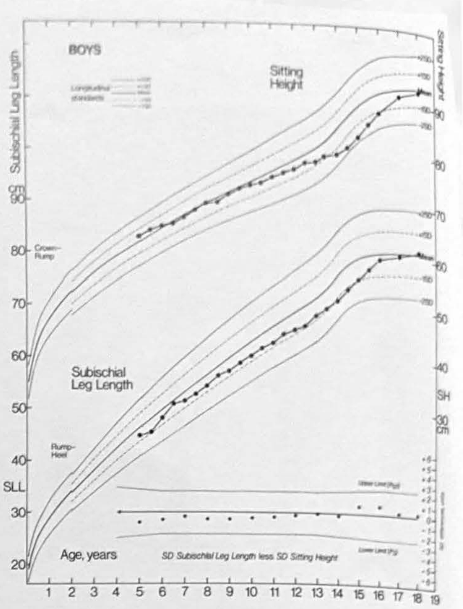
The pictures show the implicit endomorphy better at early ages than later, providing then the clue to the probable middle-aged spread. At 17 only the line of the chin, the shape of the upper arms and thighs and the always slightly full abdomen indicate the degree of endomorphy present.

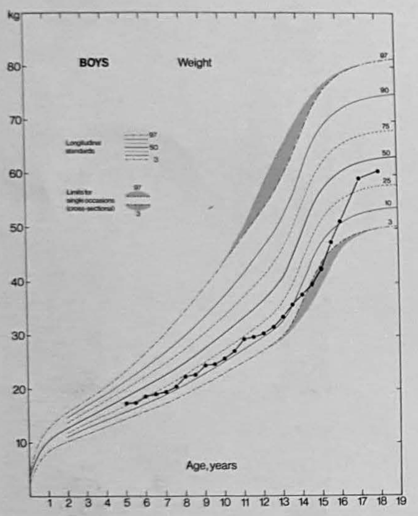


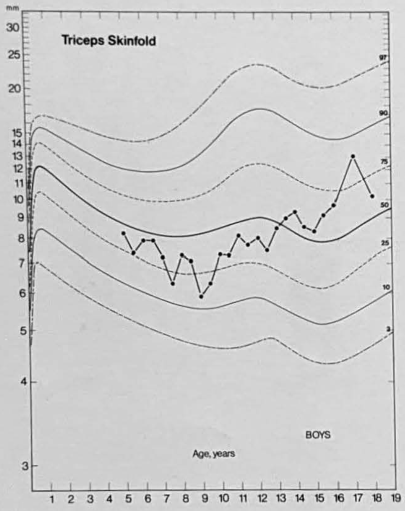
A boy equally high in endomorphy and ectomorphy, somatotype 434.

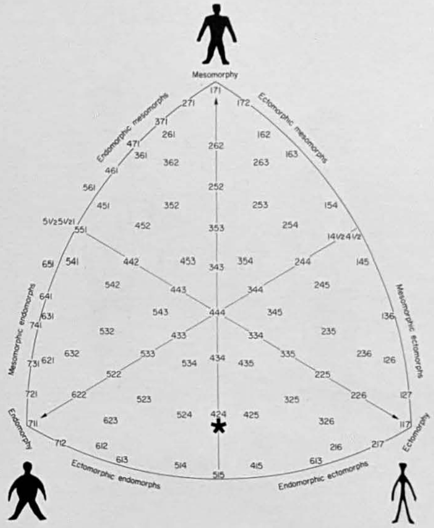


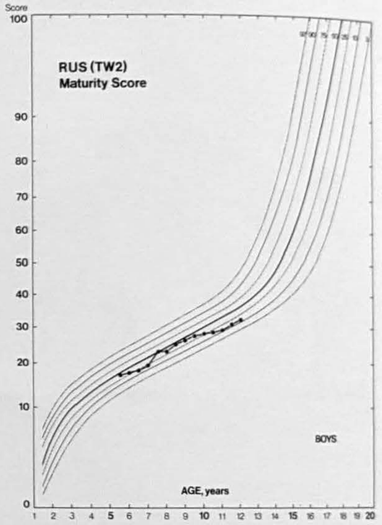


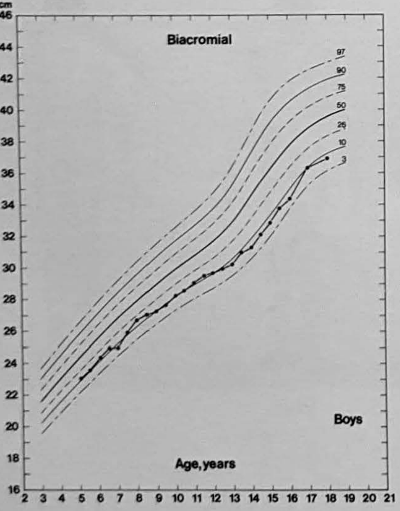


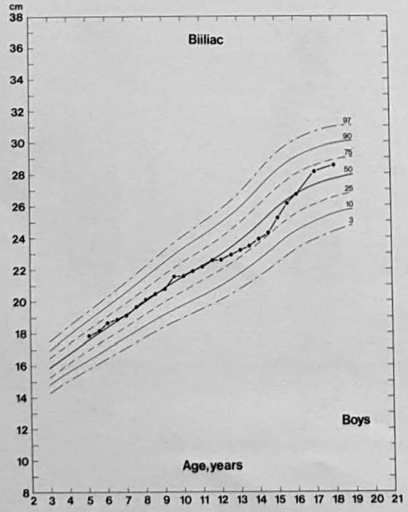












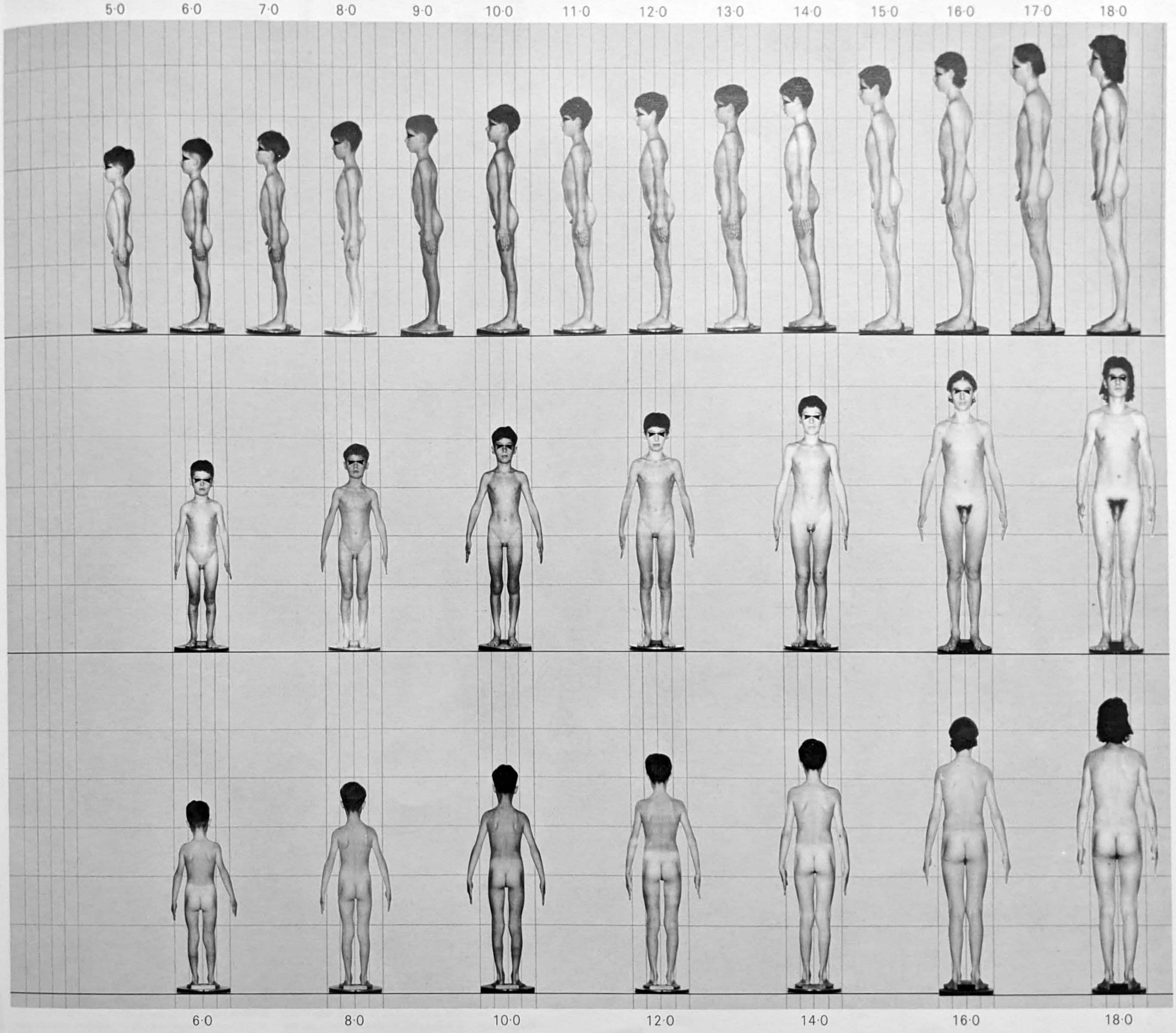
Normal Boy *Subject No. 29*

A second boy with equal endomorphy and ectomorphy, somatotype 424. His height starts and ends at the 50th centile, but from age 5 till the adolescent spurt begins it falls gradually, with a very steady height velocity (much more regular than most) at about the 25th centile. Thus by the time the spurt starts, a year later than average, height has dropped to the 5th. It then has a very large spurt, with peak velocity at about the 90th, bringing it right back to where it was at 5.

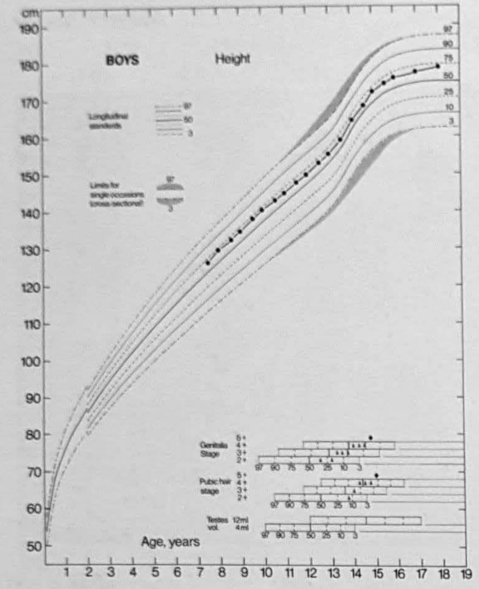
Sitting height and leg length reflect the same events, and are in close to average proportion. Leg length does not fall so far through the centiles at puberty as sitting height and has as usual a smaller and earlier spurt. Both end at the 50th centile.

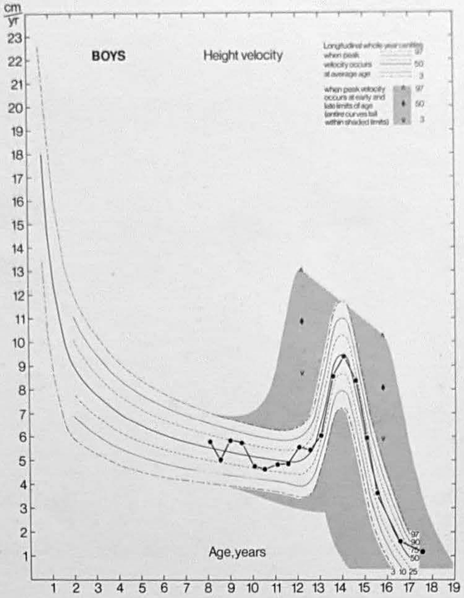
Biacromial diameter has no such marked spurt and stays at about the 10th centile throughout. Biiliac diameter, however, rather resembles height, falling steadily from the 60th to the 25th and then ending at about the 70th. Part of the final increase is probably due to fat accumulation, for the triceps skinfold rises consistently from 11 onwards, with little sign of the usual pubertal loss. Weight follows much the same course as height.

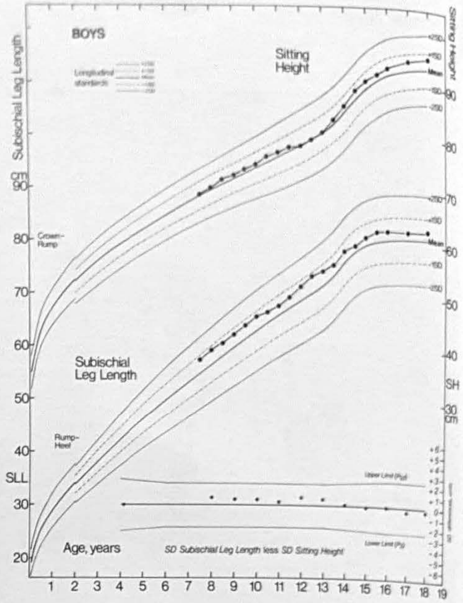
The bone maturity score is a little retarded, in agreement with the timing of the growth spurt. Genitalia and pubic hair stages are more retarded than height or bone maturity, being on average nearly 18 months late.

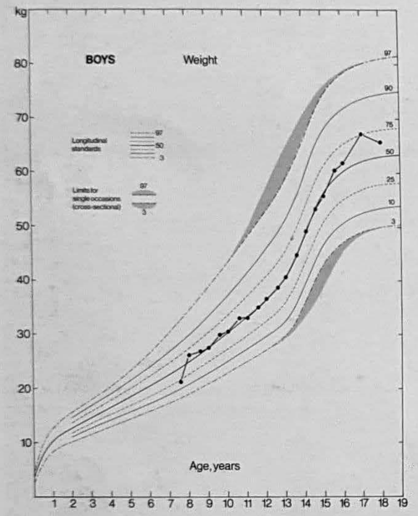


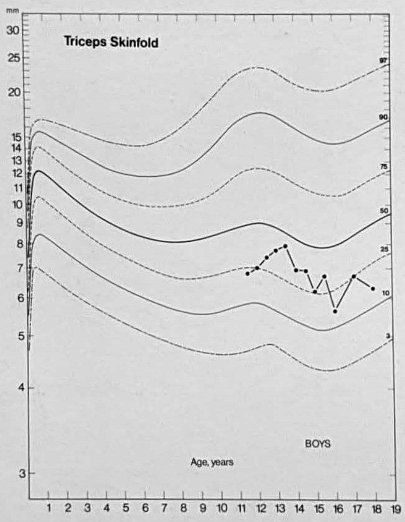
A boy equally high in endomorphy and ectomorphy, somatotype 424, with a large adolescent growth spurt.

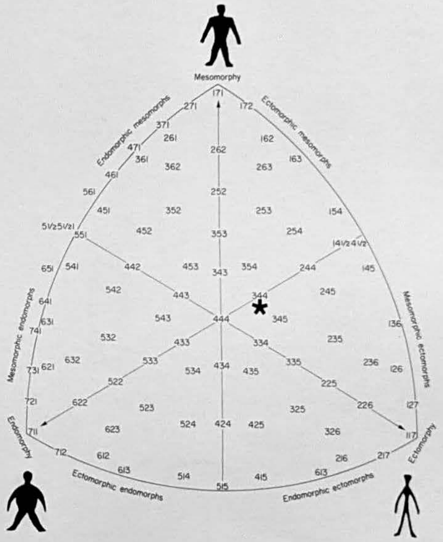


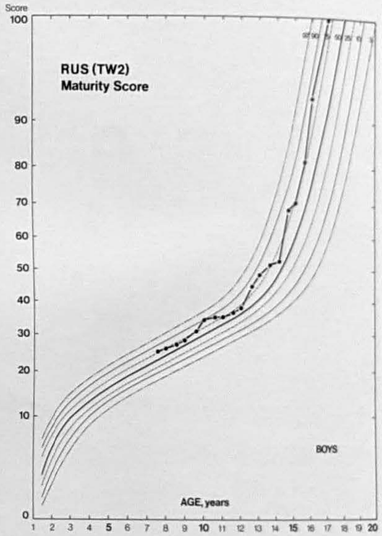


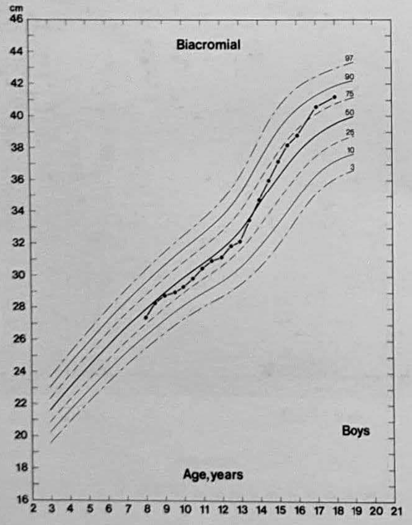


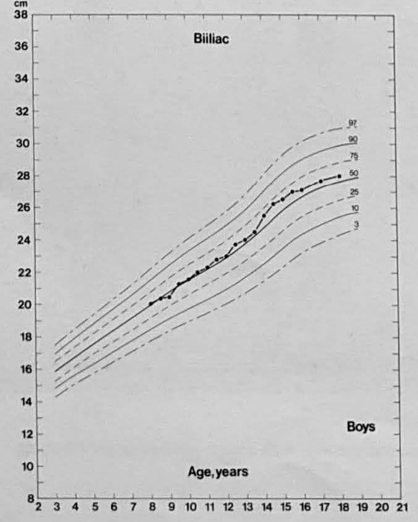












Normal Boy

Subject No. 30

The first of five boys with "balanced" physiques, that is with ratings about equal in all three components. This subject's somatotype is 344. He is slightly above average height, has an average peak height velocity at the average time; average weight, and slightly above average sitting height and leg length.

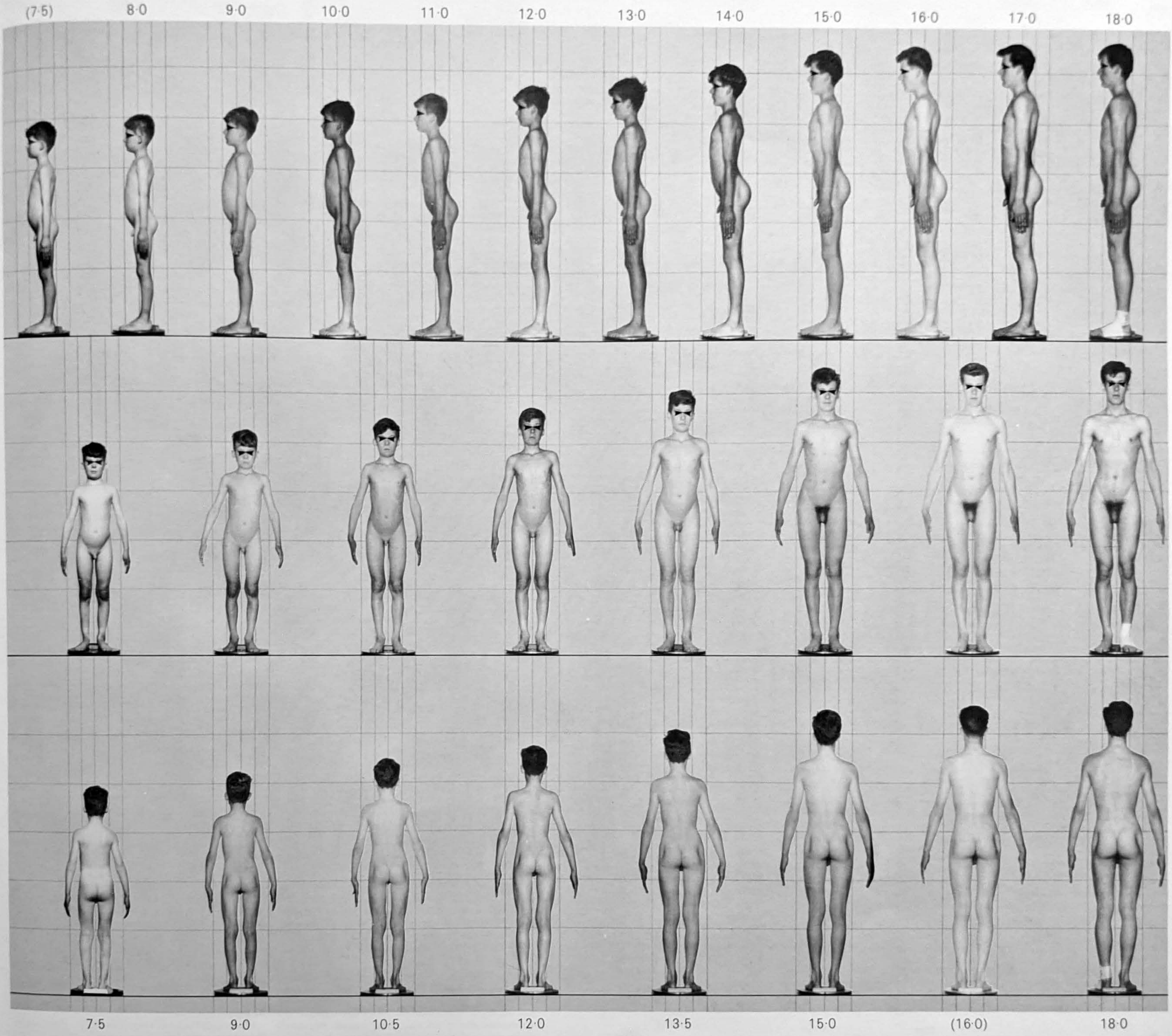
Only in biacromial diameter does he depart from Viola's "uomo medio"; at puberty his shoulders rise from the 50th to the 80th centile. Biiliac diameter remains close to the 50th. His skinfolds are lower than average, decrease during puberty and show little sign of a post-pubescent rise.

He is slightly advanced in bone maturity score, being consistently about 75th centile. This fails to agree, therefore, with the timing of his height and biacromial diameter spurts. It leads to a relatively high error in predicting his adult height at age 12·5, because at that age the bone age is 14·5 but the height spurt is not yet much developed. His actual adult height is 178 cm and his predictions at ages 8, 10, 14 and 16 are 178, 177, 177 and 178 respectively. At 12·5 however, the prediction falls to 174 (or 176 if the bone age is used as sole predictor, without chronological age).

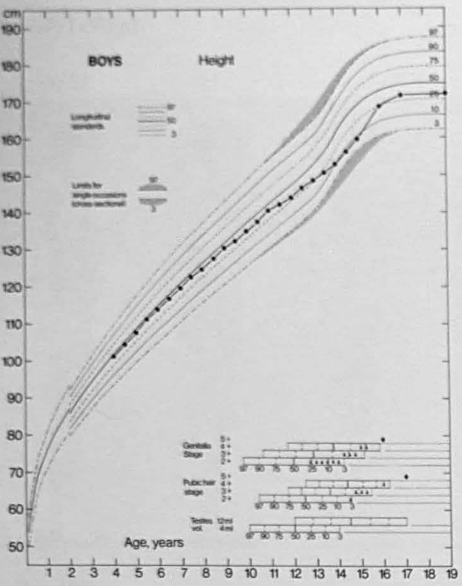
Genitalia and pubic hair stages are slightly later than average.

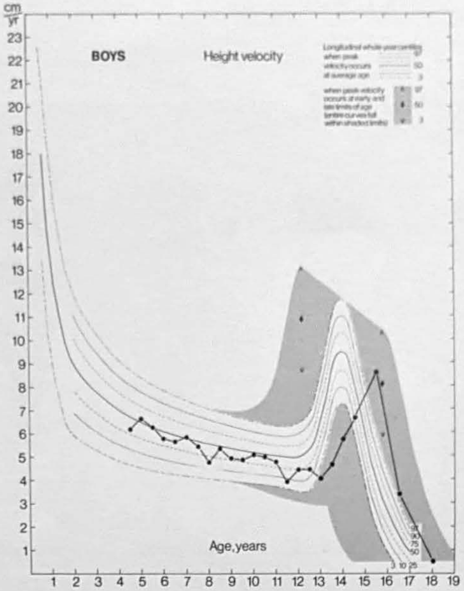
Normal Boy

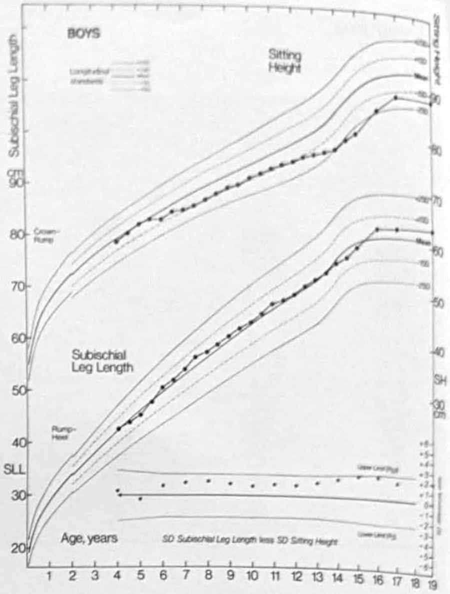
Subject No. 30

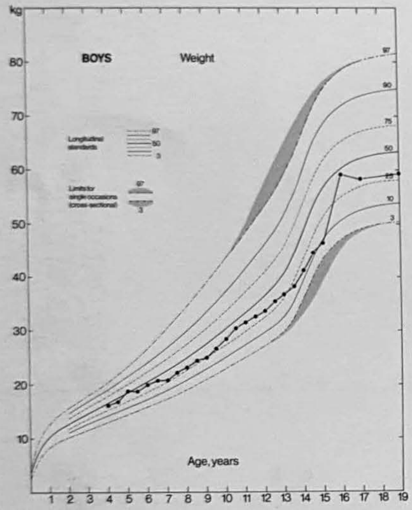


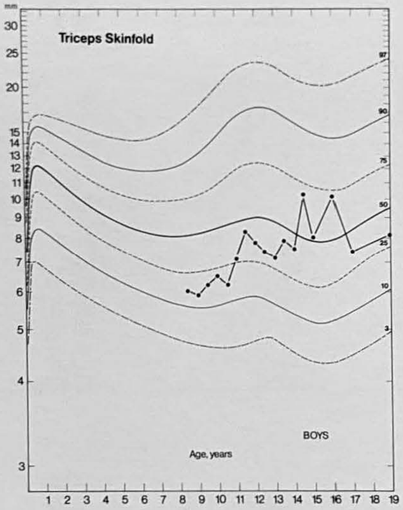
A boy of average physique, somatotype 344.

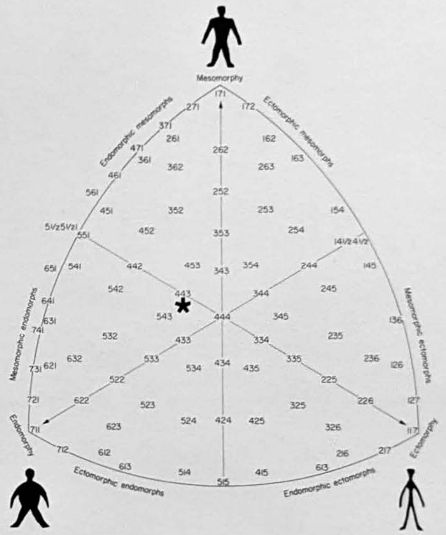


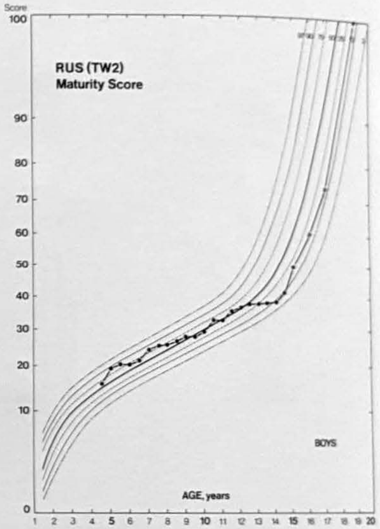


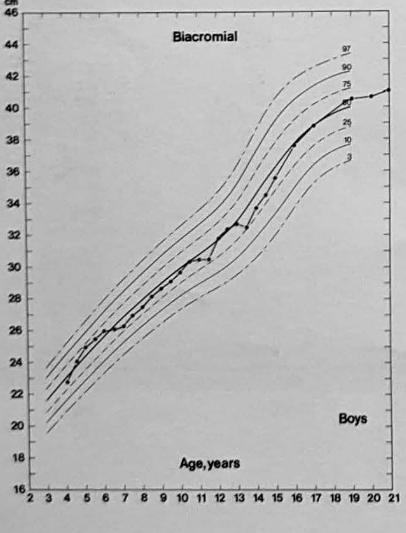


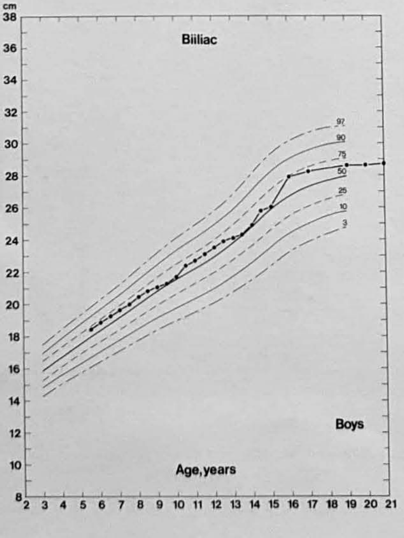












Normal Boy *Subject No. 31*

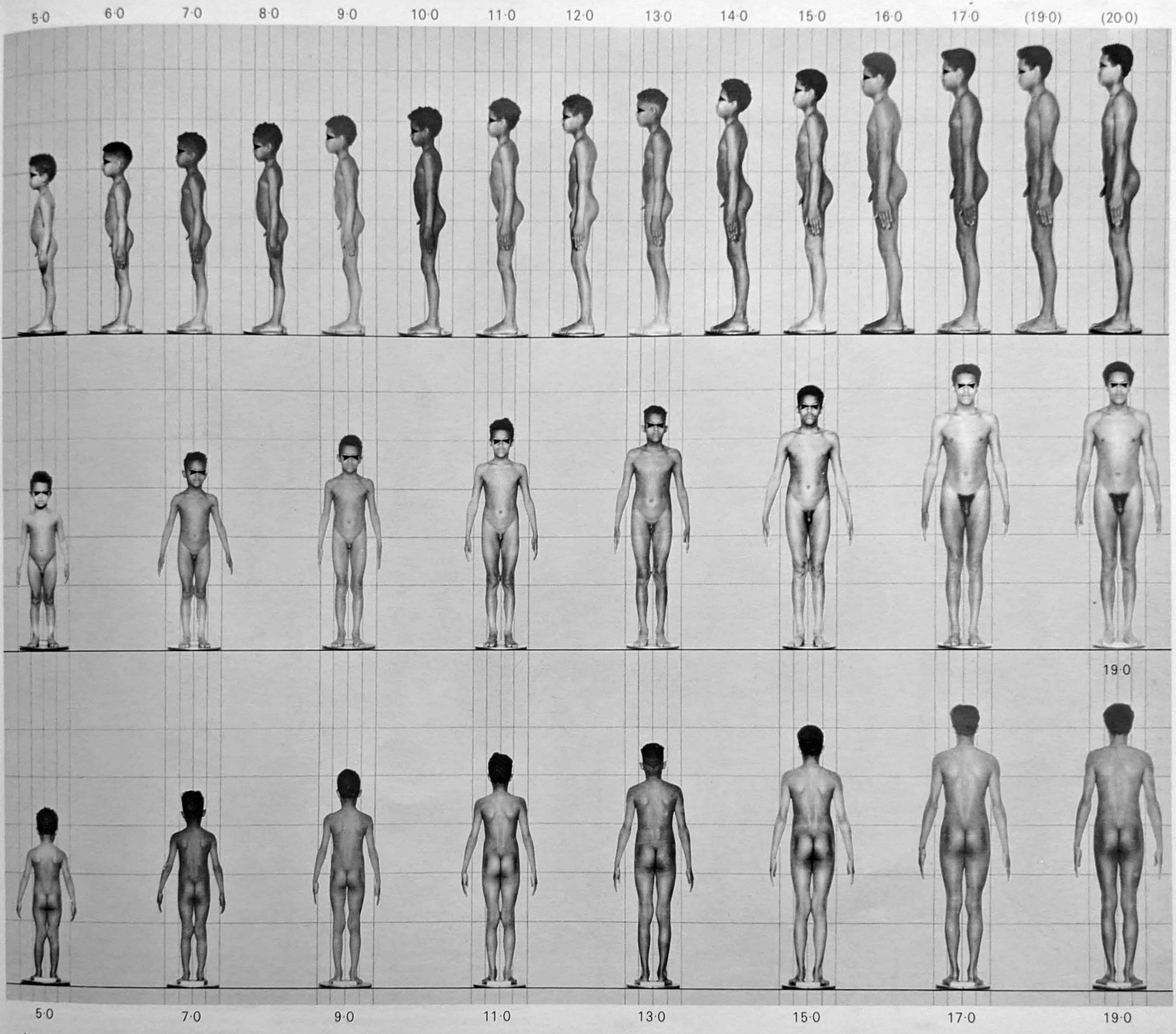
A boy of part-African parentage, somatotype 443, with an unusually late spurt of average intensity. His height centile is at the 50th at age 4 and gradually falls. Height velocity is exceedingly regular and decreases steadily from the 50th to the 25th centile. The spurt begins only at age 13 and the peak is reached nearly 2 years later than average. Though the peak itself is a little above average in value the whole spurt fails fully to compensate for the gradual drop from 50th to 10th centile and final height is about the 30th centile.

The subject shows the long legs of the African physique with leg length being at the 50th centile before puberty and 60th centile after it, and sitting height at the 30th centile before puberty and the 15th after. Nevertheless the difference between the SD scores stays just within the European limits. There is a slight lordosis.

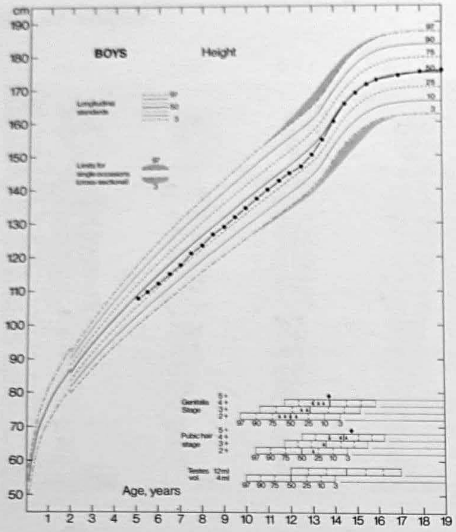
Biacromial diameter stays around the 50th centile throughout and biiliac starts and finishes around the 60th. Evidently this boy is not an easy subject on whom to measure shoulder width; there are occasions when errors of around 0·4 cm seem probably to have arisen. This is in contrast to height, which is a very accurate measurement in this subject. Probably he is trying too hard to position himself for the measurer; in biacromial diameter this may lead to rigid, rather than slumped shoulders.

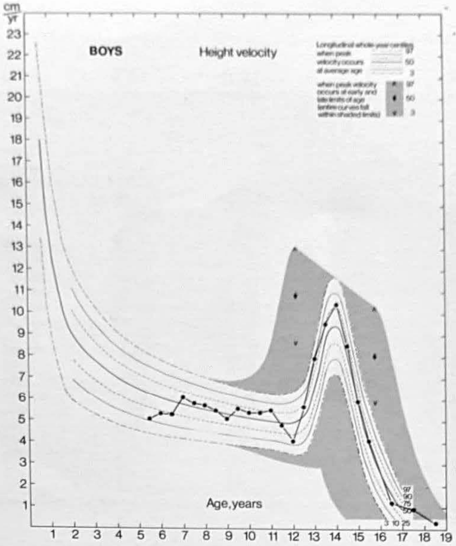
Triceps skinfold rises from age 8 to 16 then drops a little; weight remains fairly constantly at the 25th centile except for an increase at age 16.

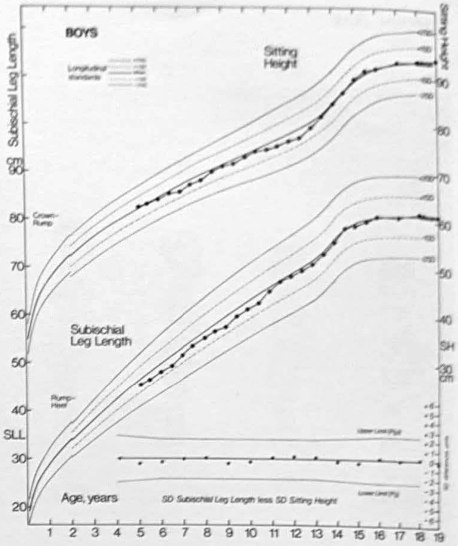
Bone maturity score is at first higher than average but falls through the centiles and hardly increases at all from 12 to 14. Thereafter the increase is at the average rate. Genitalia and pubic hair stages are reached some 18 months to 2 years later than average, in agreement with the peak height velocity.

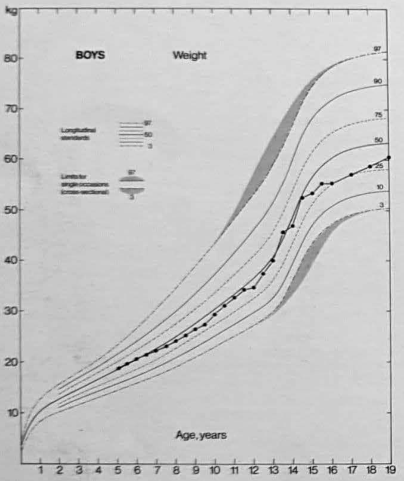


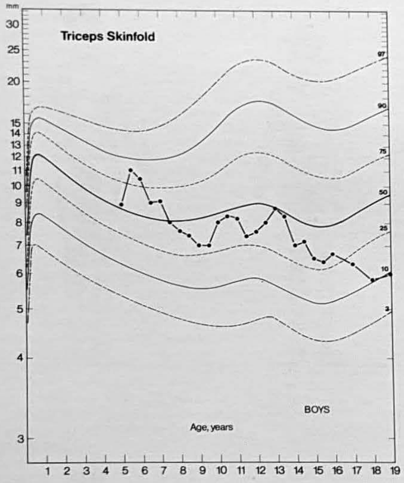
A boy of part-African parentage, somatotype 443, with a late adolescent growth spurt.

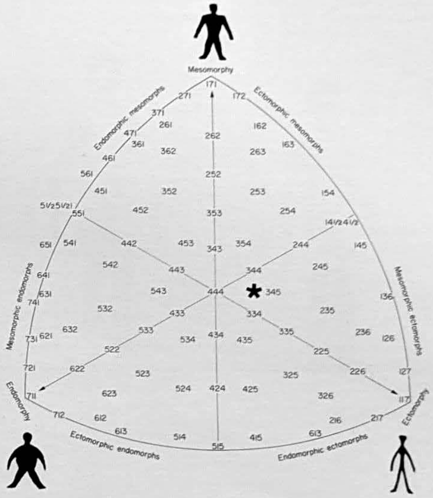


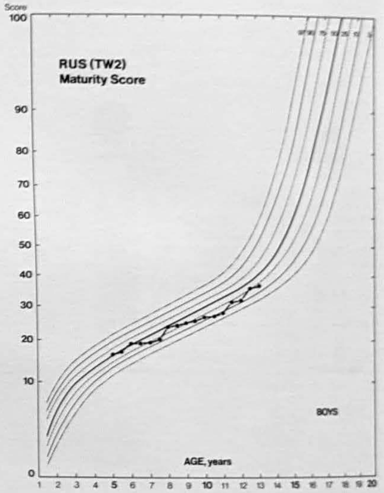


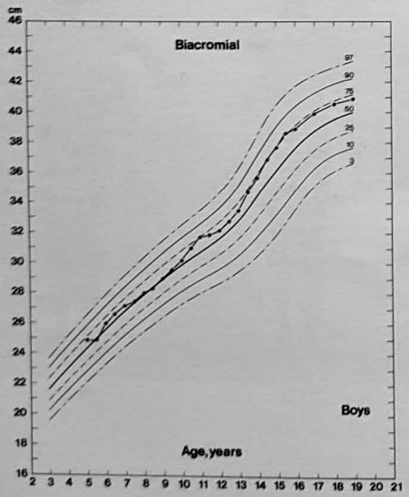


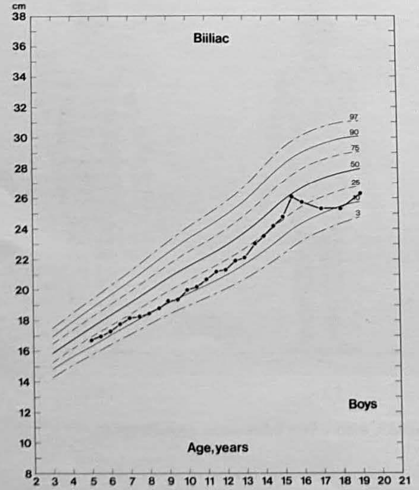












Normal Boy

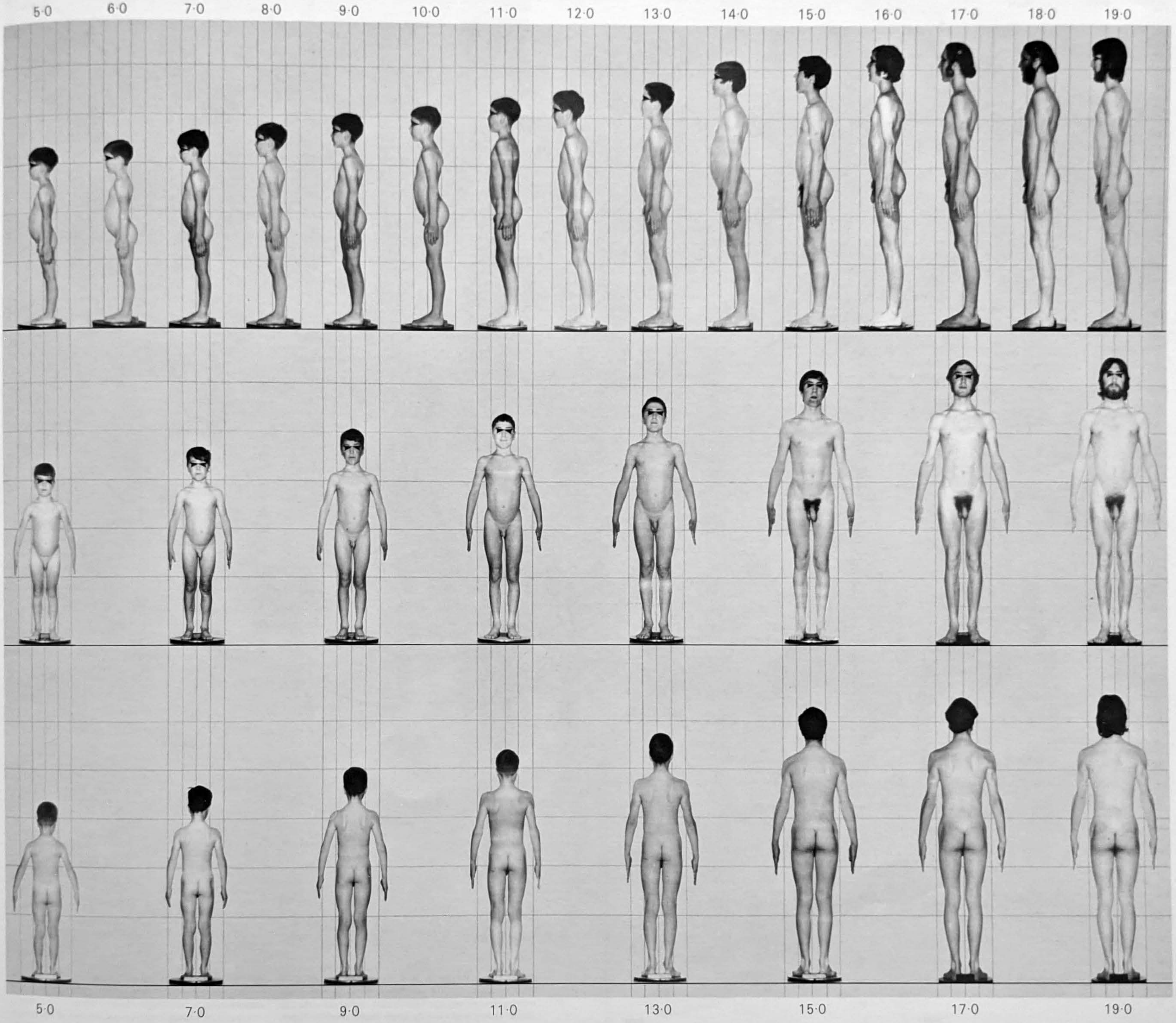
Subject No. 32

A boy with "central" somatotype 33½4, and a height spurt which occurs at the average time but is of greater than average intensity. Height is about the 30th centile till puberty, when it increases to the 50th. Peak height velocity reaches the 80th centile. There seems to be a drop in height velocity just before the spurt begins, as noted in one or two other subjects (e.g. nos 5, 18, 31).

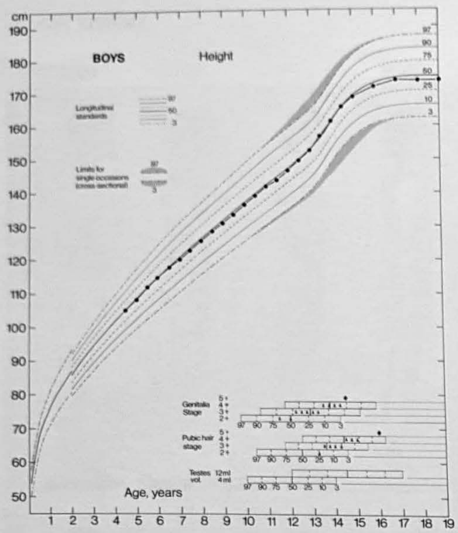
Sitting height and leg length have very similar curves to height and both end at the 50th centile.

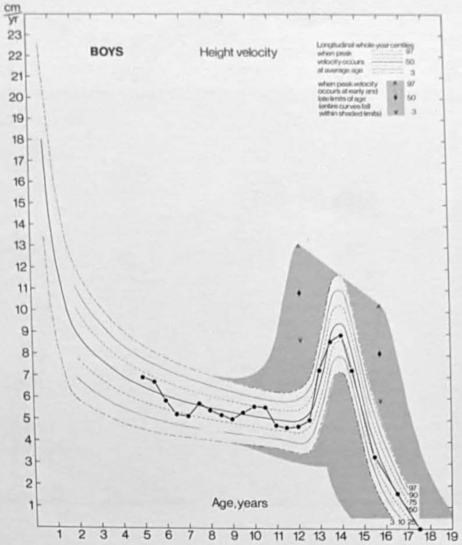
Biacromial diameter is between the 50th and 75th centiles throughout and biiliac diameter starts and finishes around the 20th. There is a poor measurement (not due to fat) at 15·5 in the latter. Triceps skinfold is at about the 50th from 3 to 7 but drops gradually, ending at the 10th. Weight shows a similar decrease in position from the 50th to the 25th in late puberty.

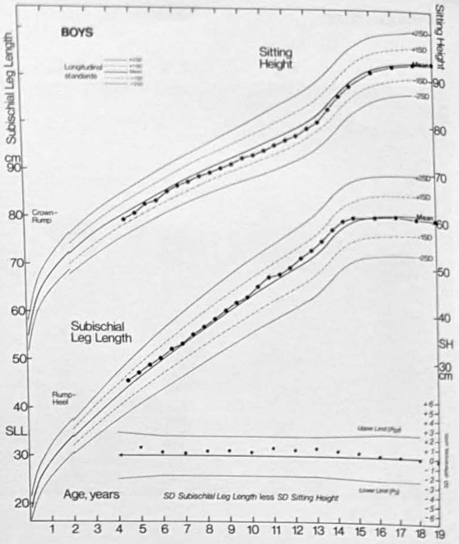
The bone maturity score is around the 25th centile from 5 to 13 years and unavailable thereafter. The early genitalia stages occur at the average time, but later ones are a little advanced. Pubic hair stages 3, 4 and 5 are reached at about the average time.

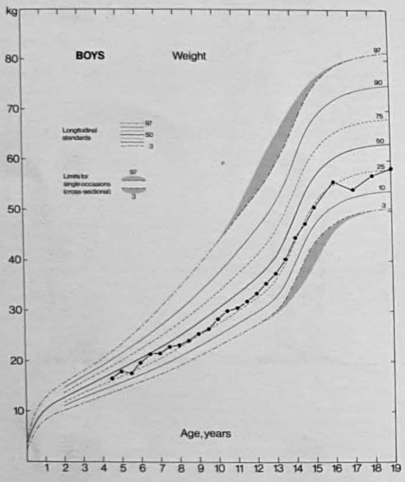


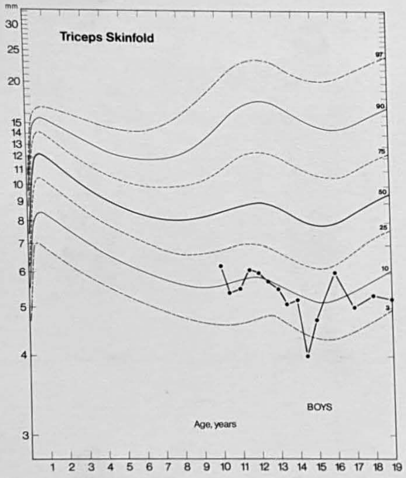
A boy of average physique, somatotype 33½4, with a large adolescent growth spurt.

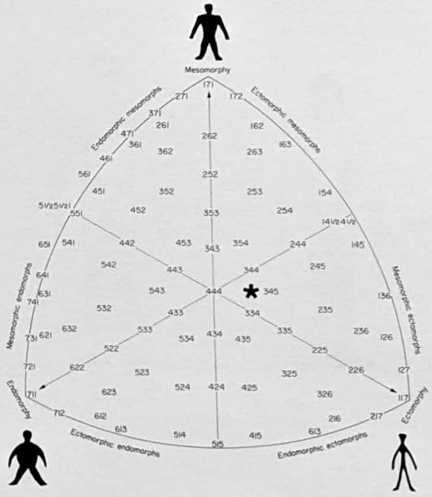


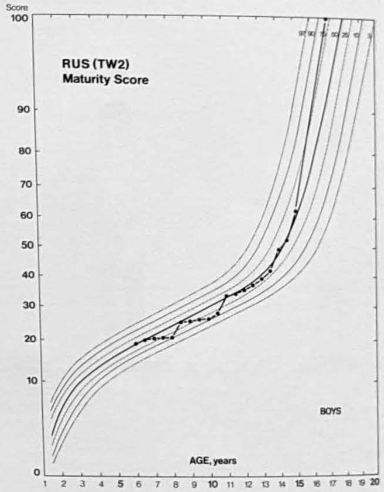


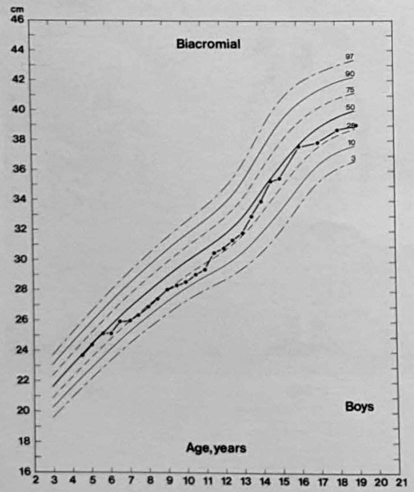


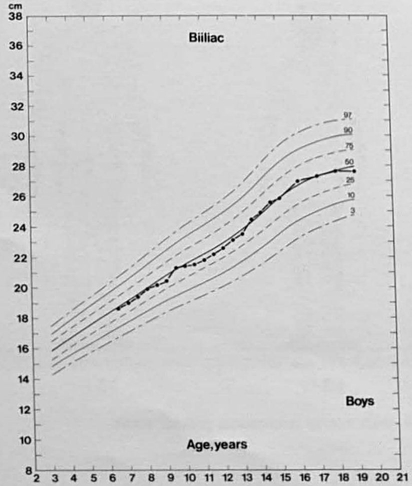












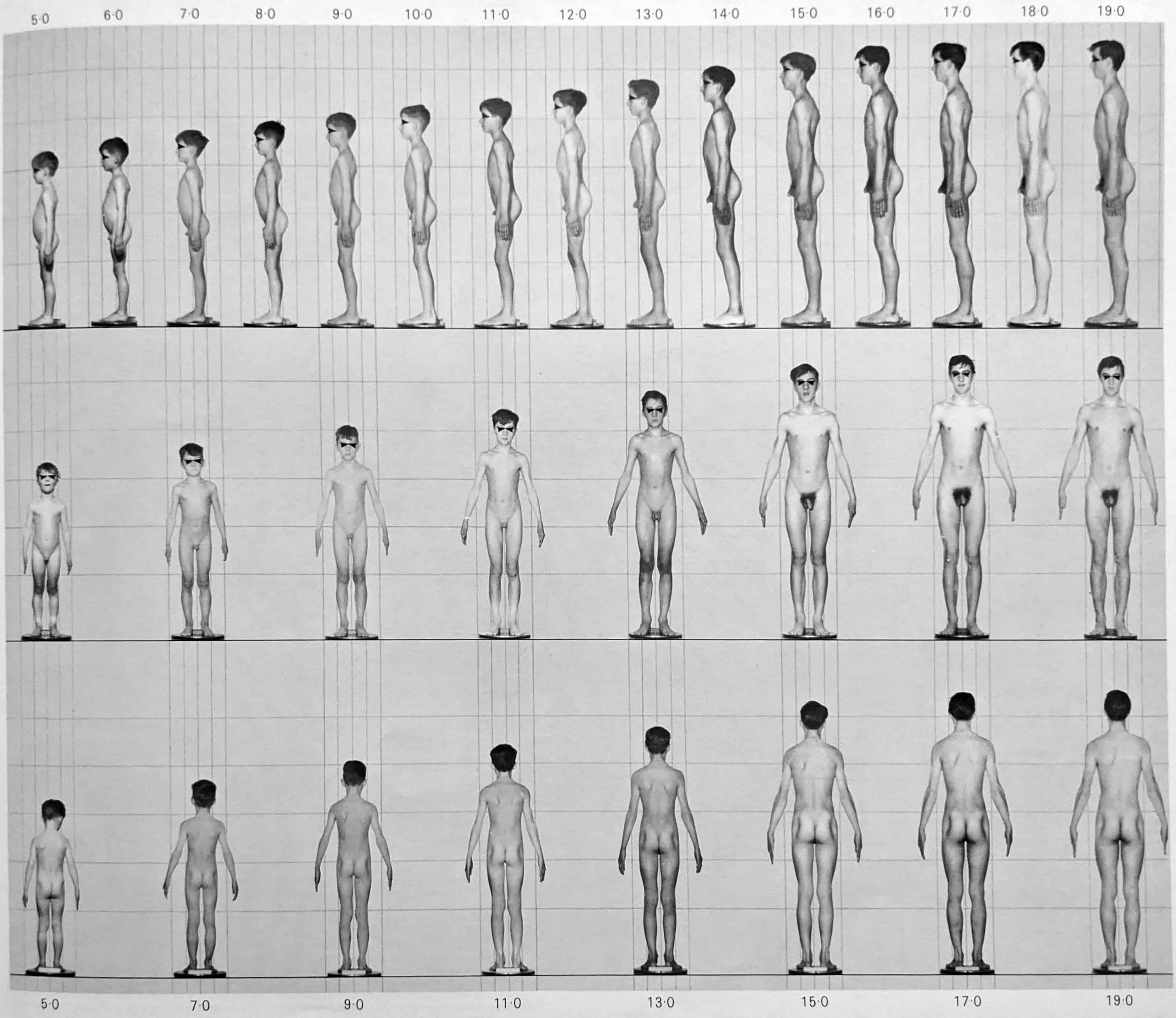
Normal Boy

Subject No. 33

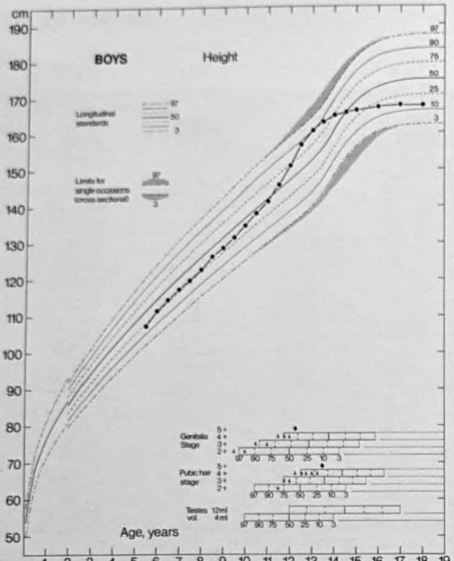
A boy who is average in most respects, somatotype 33½4. Height is consistently at the 50th centile, and peak height velocity at the average age, with the peak itself at about the 35th centile. Sitting height and leg length closely resemble height.

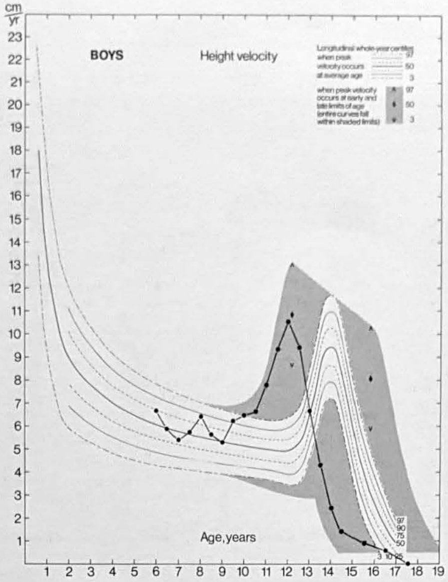
Biacromial diameter varies between the 50th and 25th centiles (and seems a little hard to measure judging from the irregularity of its curve) and biiliac diameter is throughout at the 50th. Of the other measurements only weight and triceps skinfold depart from the mean. Triceps is around the 10th centile with a particular drop at age 14·5 (approximately corresponding to peak height velocity). Weight is consistently around the 25th centile except for one occasion of actual loss.

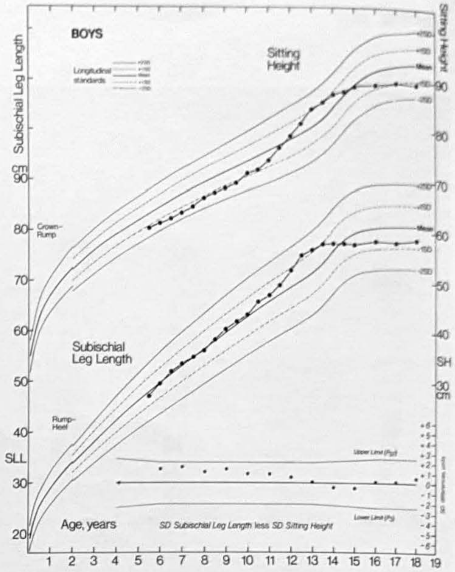
Bone maturity score is a little below the 50th except at final fusion, which is early. Genitalia development occurs at the average age and pubic hair development slightly later than average.

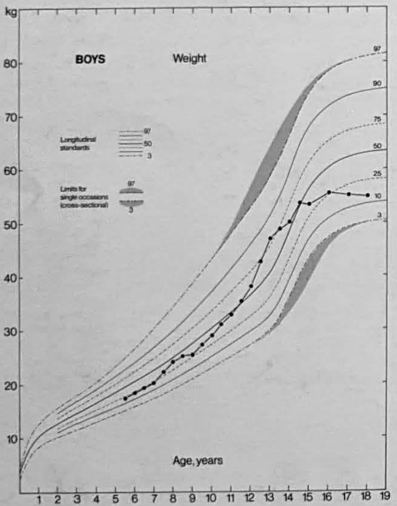


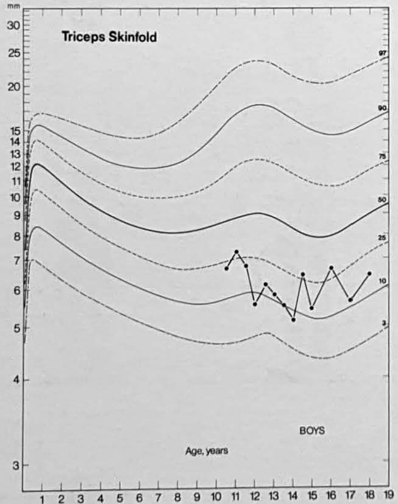
A boy of average physique, somatotype 33½4, average size, and average tempo of growth.

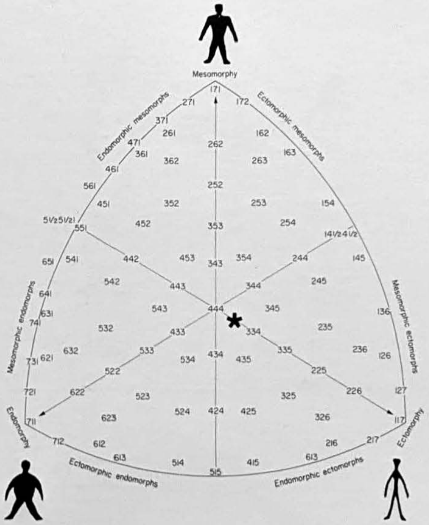


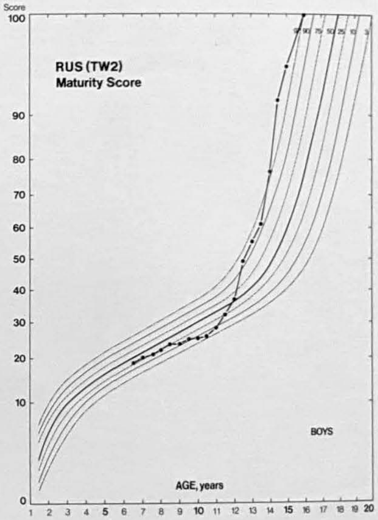


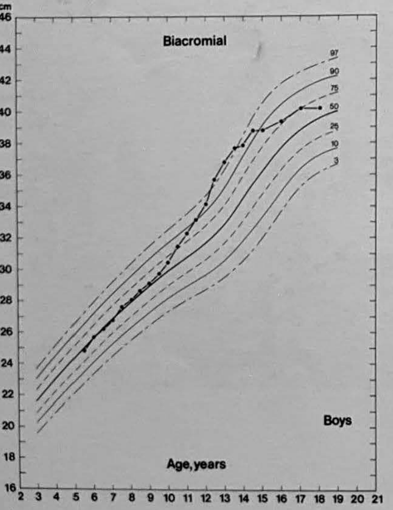


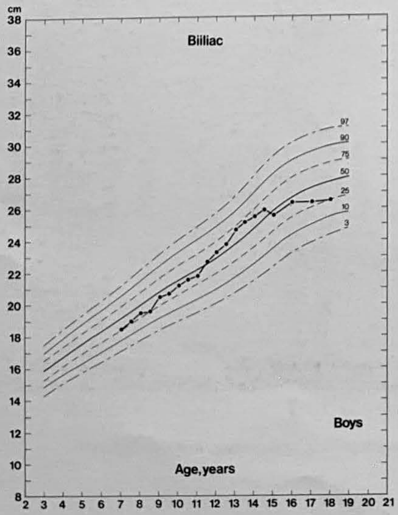












Normal Boy

Subject No. 34

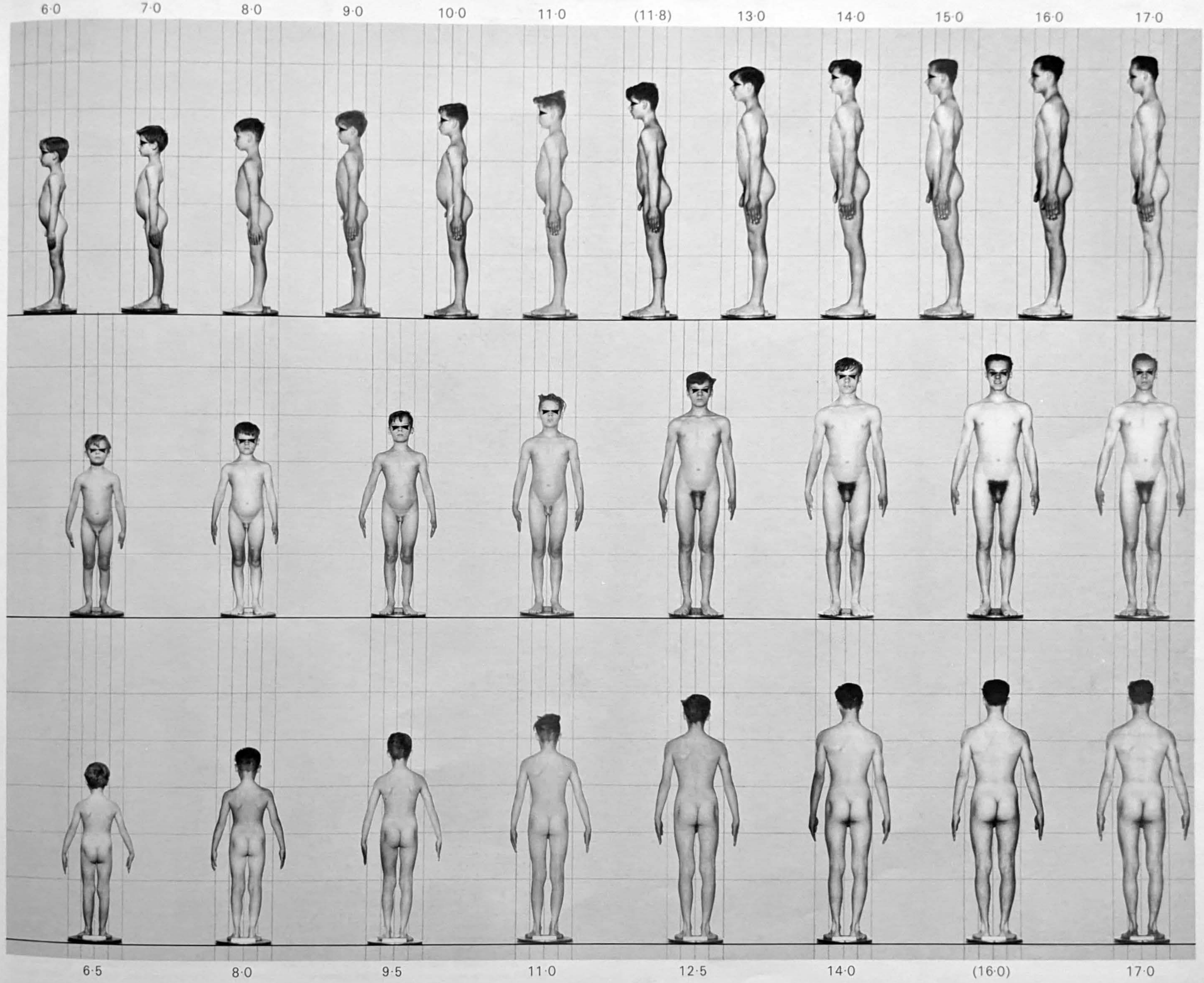
We end this section of normal boys with the earliest maturing boy in the series. His somatotype is 3½3½4. Height is around the 25th centile from 5 to 10, but due to the very early spurt it reaches the 90th centile at age 13 before dropping back to end at the 15th. Peak height velocity is a little lower than average for the age of peak; thus the spurt does not quite keep height at the pre-pubertal centile, though his early maturing probably makes it hard for the subject to recognize this. He has to cope with being short, then tall and then short again.

Sitting height and leg length have similar curves to height. The legs are initially long relative to the trunk (SD scores 0 and −1 respectively) but the early spurt causes the legs to stop growing after age 13·5 and at maturity the SD scores are closer, at −0·7 and −1·2. The curve of SD differences shows the recession of the legs from long to average proportion.

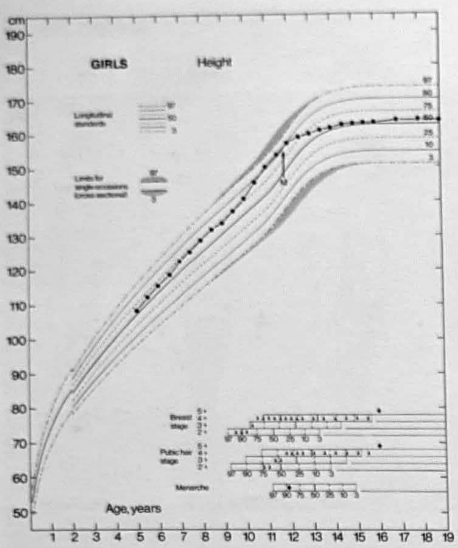
Biacromial diameter has a curve also similar in shape to that of height, though at a higher level. At the 50th centile from 5·5 to 10 years, it rises to above the 97th centile before falling back to the 50th. Biiliac diameter shows the same thing but to a much less marked extent. Triceps skinfold remains between the 10th and 20th centiles, and weight begins and ends at the 15th centile.

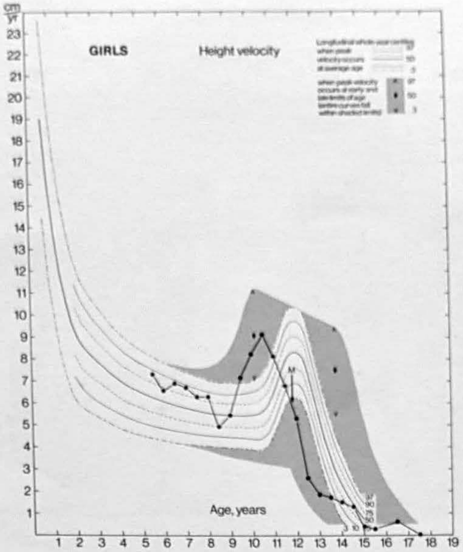
Bone maturity score is at first not advanced, but starting at 11 increases with extreme rapidity, passing from the 10th to the 97th centiles in the space of 3 years. All genitalia and pubic hair stages are reached very early, at about the 97th centile for timing.

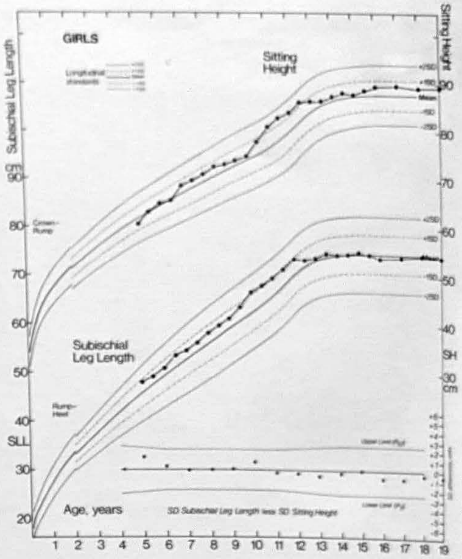
The pictures, presented at 18 month intervals, show the very rapid growth from 11 to 12·5 and the equally rapid development of the secondary sex characters at this time (centre panel).

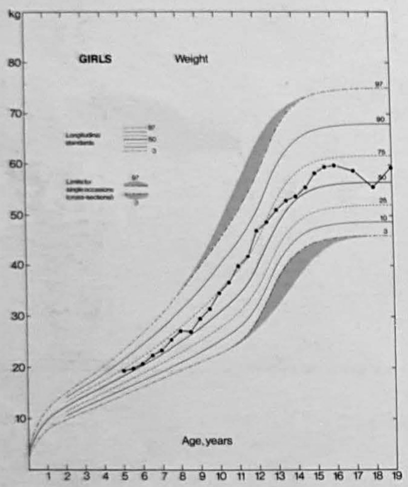


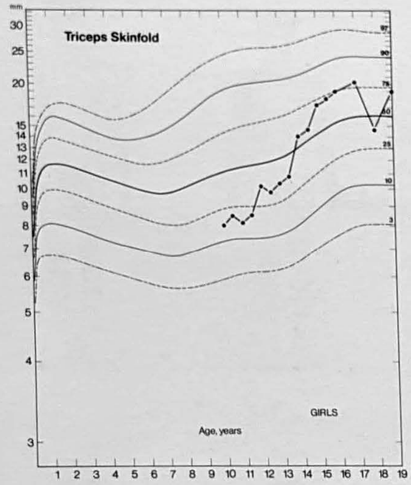
A small, very early-maturing boy of average physique, somatotype $3\frac{1}{2}3\frac{1}{2}4$.

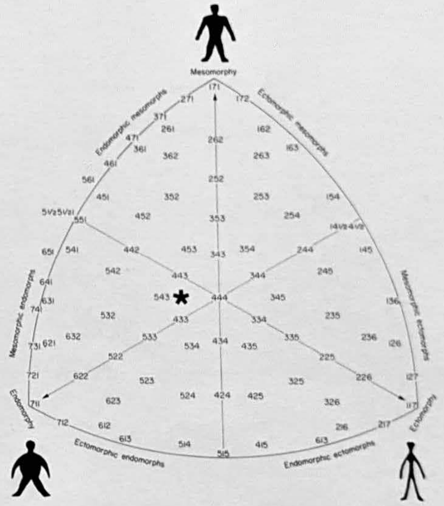


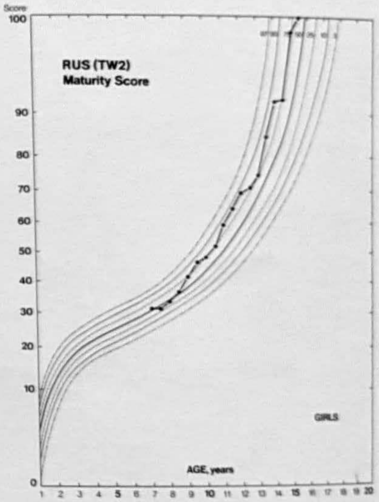


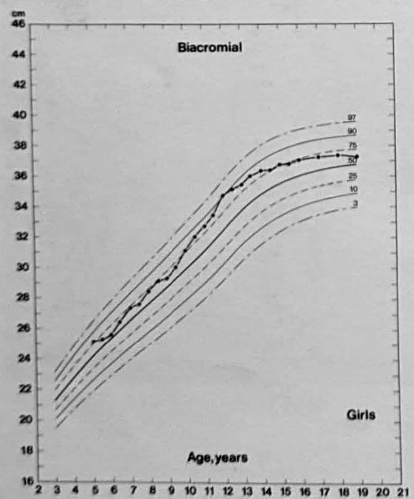


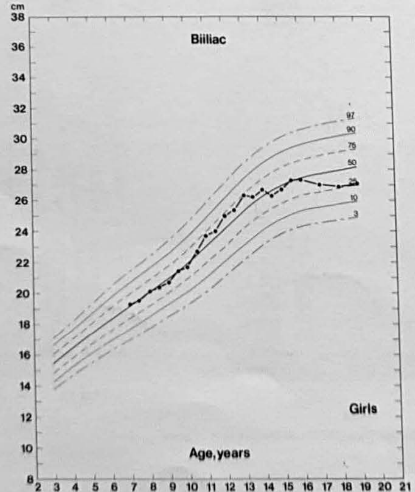












Normal Girl

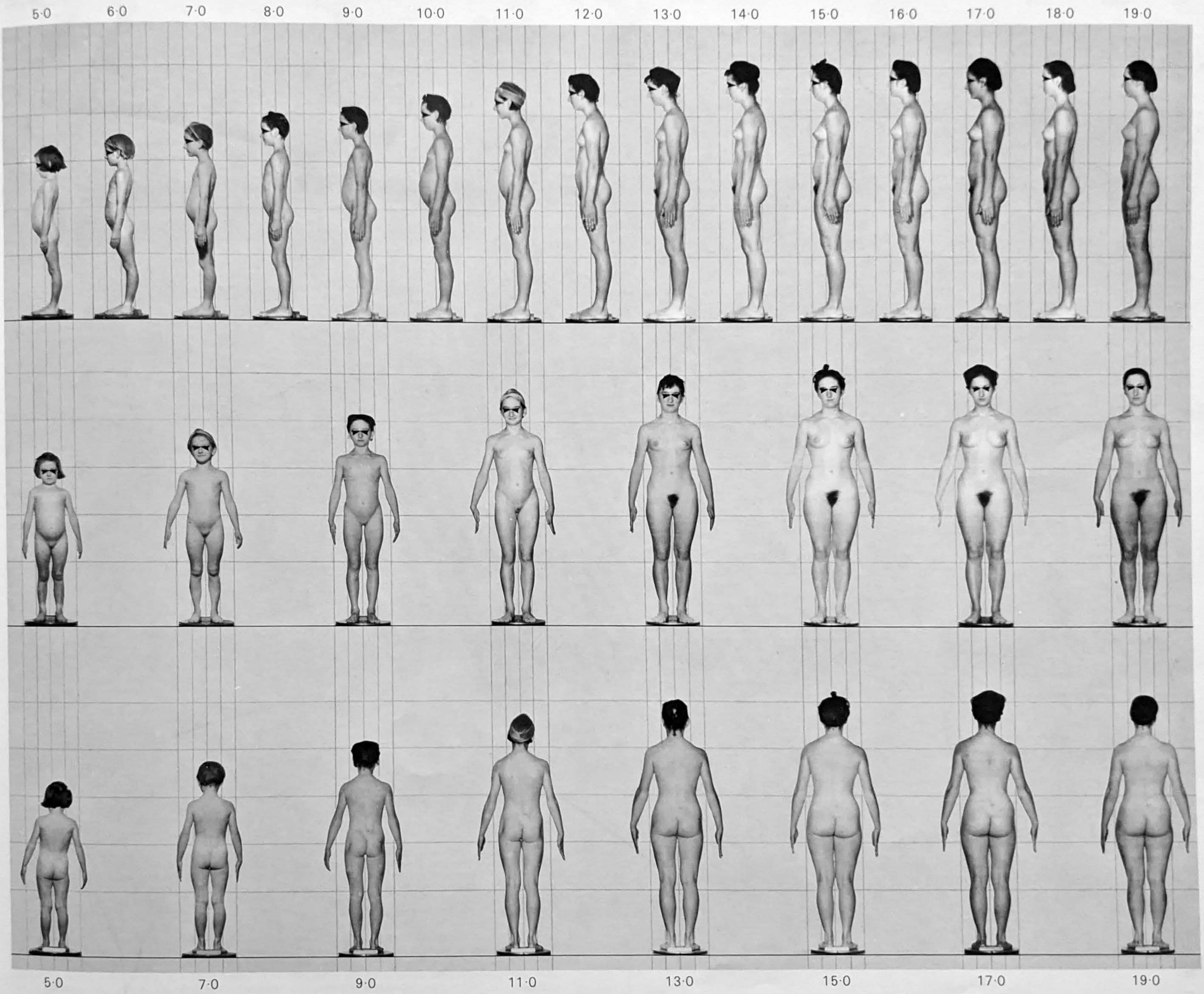
Subject No. 35

The most mesomorphic girl in our series. We have no girls who are 4 or 4½, which is the upper limit for females, when, as here, the somatotyping is carried out according to the scale for young men. Height is average, though it rises to the 90th centile at age 11 due to an early spurt. The peak height velocity is exactly at the 50th centile for the age at which it occurs, which is 1·5 SD early. Menache occurs at age 11·8 (1·2 SD early) at about the usual position in the height curve.

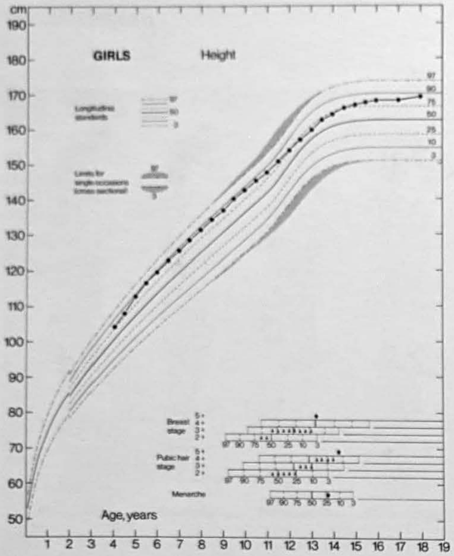
Sitting height and leg length also have very early spurts, with peak leg length velocity between age 9 and 10, and peak sitting height between 10 and 11.

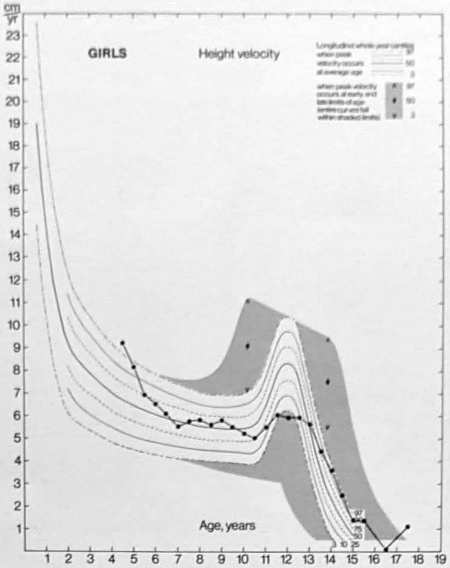
Biacromial diameter follows a very similar curve to height, starting and ending at about the 50th centile; biiliac diameter starts at the 50th but ends at the 25th. Weight and skinfold follow curves just above or below the 50th centiles. There is a considerable effort to diet at age 16 to 17 with marked effect till 18, then relapse.

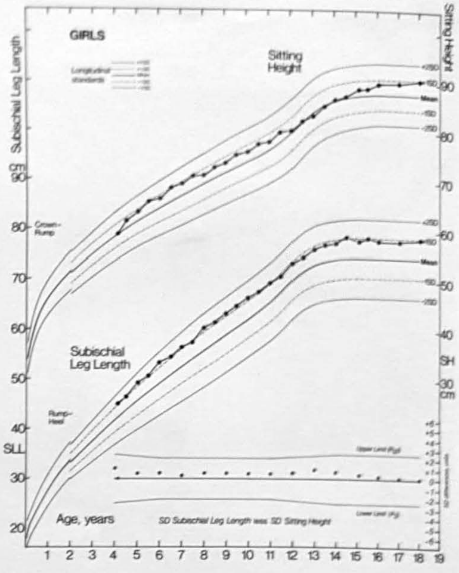
Bone maturity score starts at the 50th, but by 9·5 years reaches the 75th where it remains thereafter. It is, therefore, considerably less advanced than height. The bone age at menarche, however, is 12·8 "years", only a trifle earlier than average (13·0). Breast stages 2, 3 and 4 are reached early, but this subject remains in stage 4 for a very long time. Less usually, she remains in pubic hair stage 4 also till a late age.

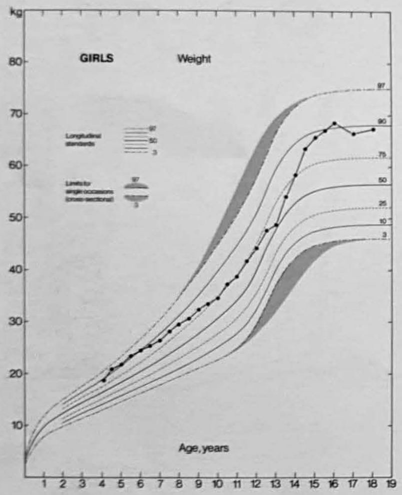


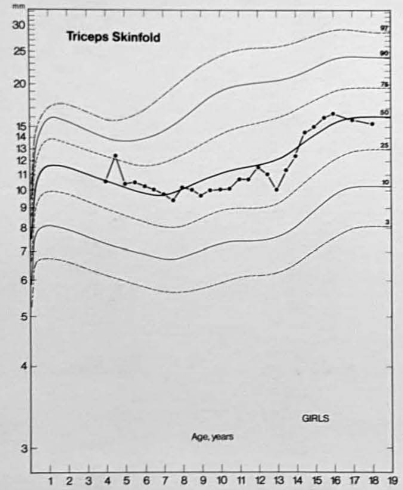
An early-maturing girl, with relatively high mesomorphy (for girls), somatotype 43½3.

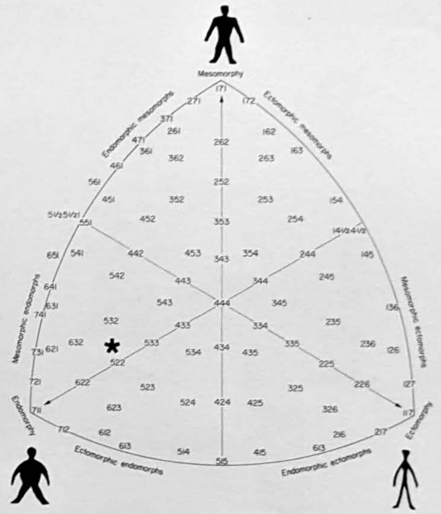


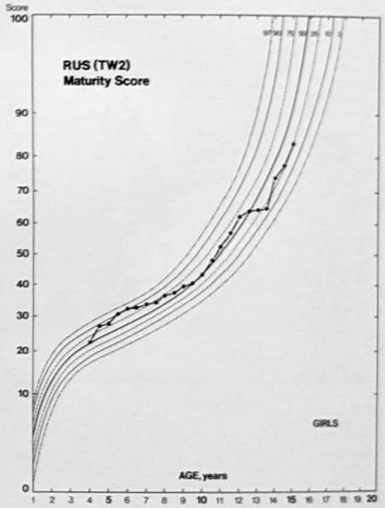


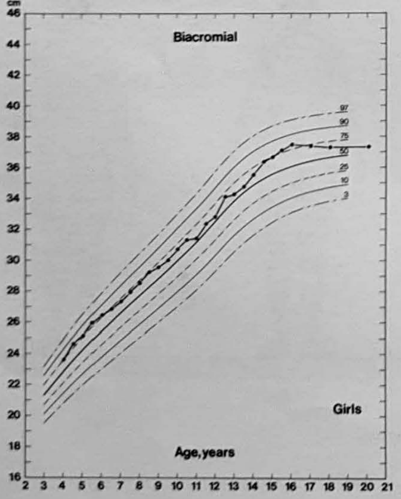


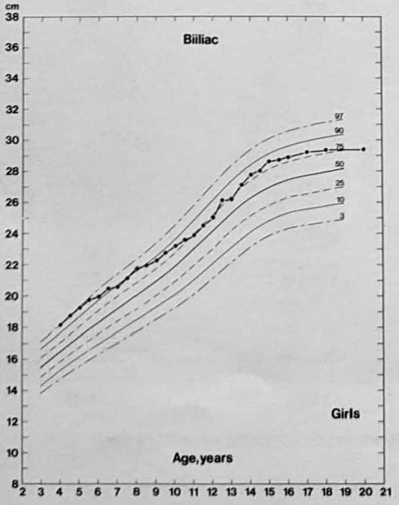












Normal Girl

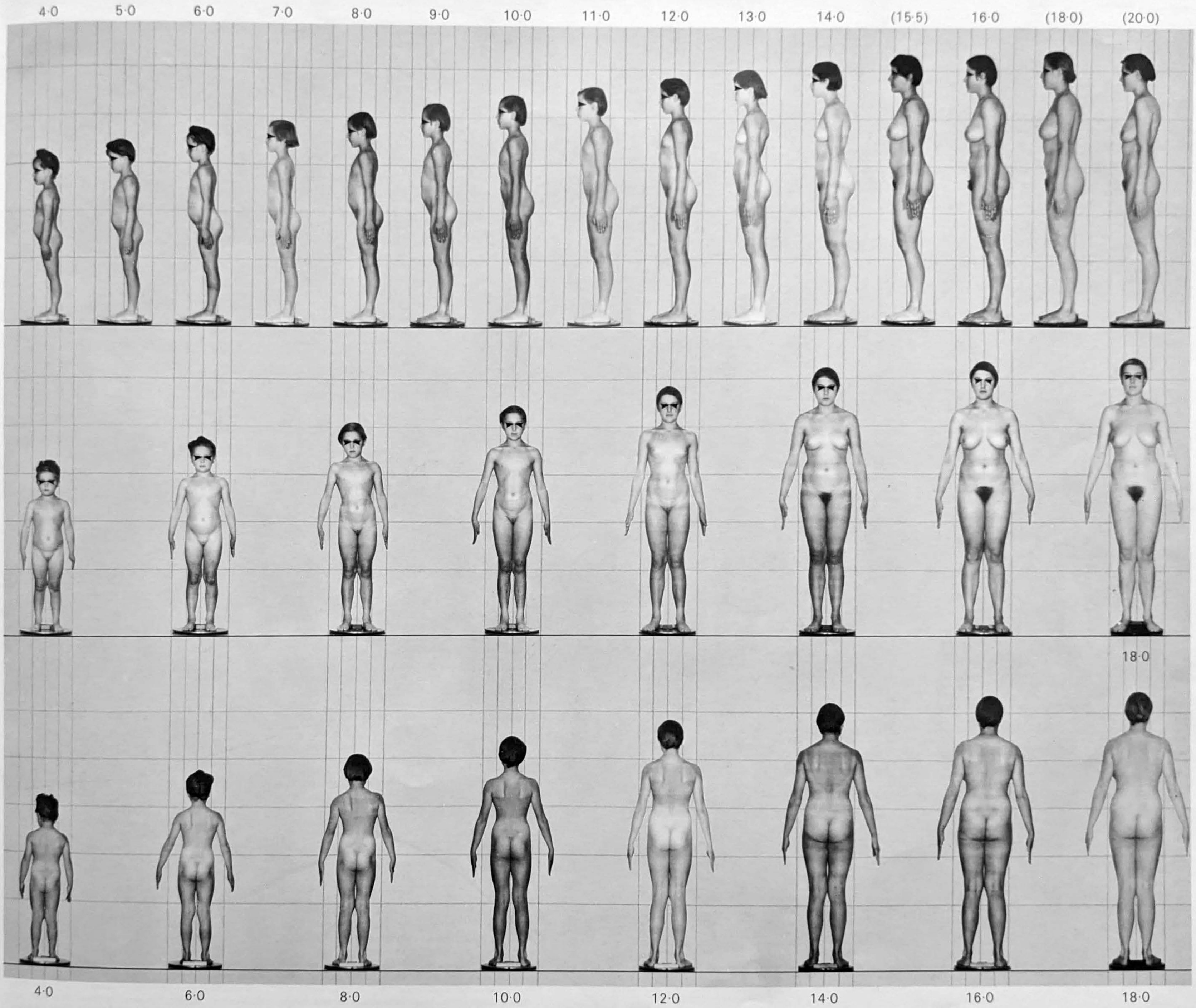
Subject No. 36

A second relatively mesomorphic girl, with averagely high endomorphy (for women). Her height rises from the 75th to the 90th centile, falls a little at adolescence, but returns to near the 90th. The height velocity curve is quite unusual. The initially high velocity (perhaps representing catch-up growth in an improved environment) soon settles onto the 50th, but the peak height velocity only reaches the 3rd centile for peak. However the spurt is more prolonged than average, so that its whole contribution is greater than that of a truly 3rd centile spurt, and indeed returns the subject at maturity to her prepubertal centile. Thus the spurt is not small in total effect; it is just very prolonged. The peak seems to be at about the average time. Sitting height has a prolonged and low-peaked spurt, like height; the leg length spurt is scarcely visible. Both start and finish at +1 SD.

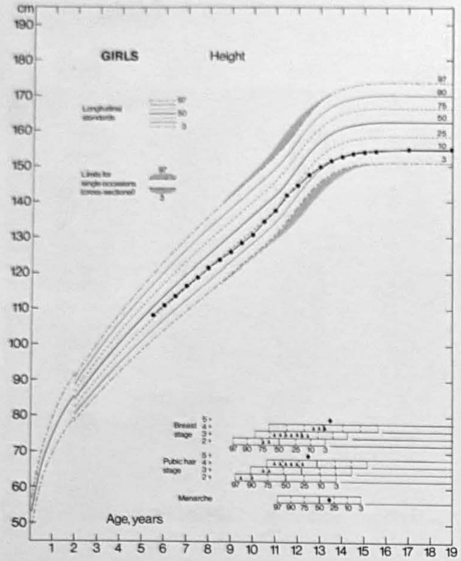
Biacromial diameter starts at the 75th centile but is reduced to the 60th by the end of puberty. Biiliac diameter is gradually reduced from the 97th centile to the 75th. Weight is at the 90th centile at first, reduces to the 75th and finally rises to the 90th again. Triceps skinfold remains around the 50th centile throughout.

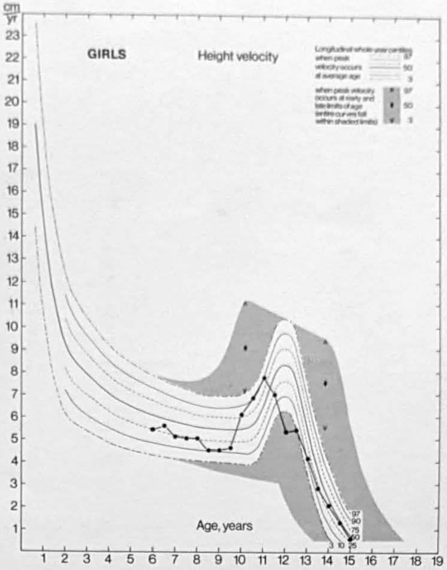
Bone maturity score is at first advanced, but gradually reduces to the 50th, stabilizes there for a few years and then drops to the 25th. Menarche is at 13·7. Breast stage 2 is reached early, stage 3 at about the average age and stage 4 skipped. Pubic hair is slightly delayed, agreeing with menarche.

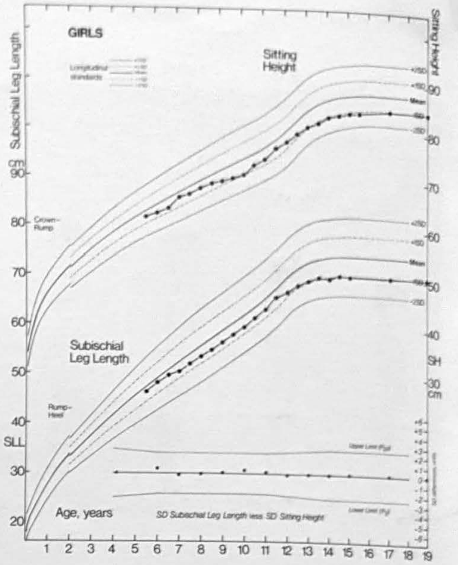
The pictures show a girl with knock knees from an early age (or at least from 4, when she was first examined). The problem does not diminish with age (as it does in some children) and at 18 she still has considerable valgus deformity.

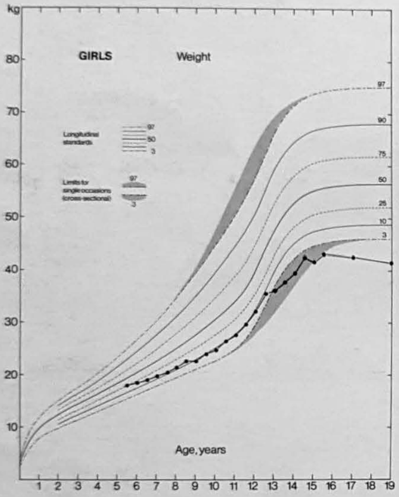


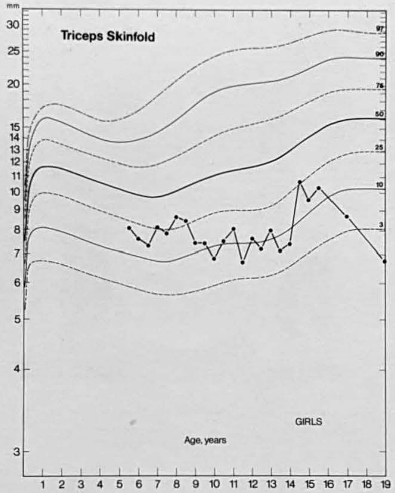
A large girl, relatively high in mesomorphy as well as endomorphy, somatotype 5½32½, with a remarkably small adolescent growth spurt.

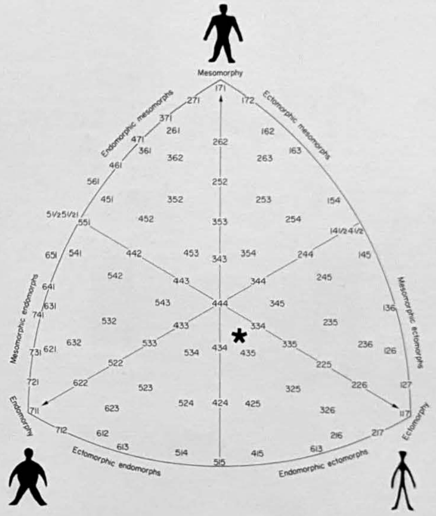


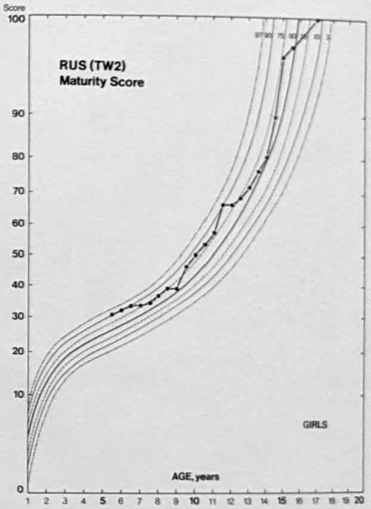


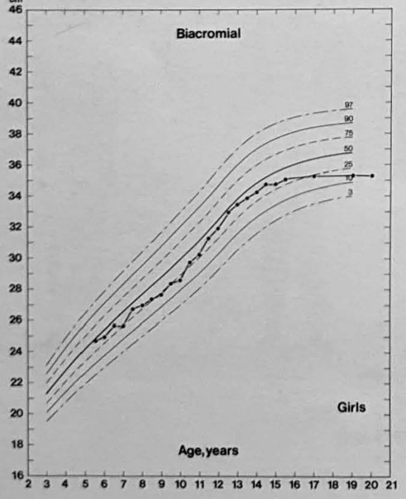


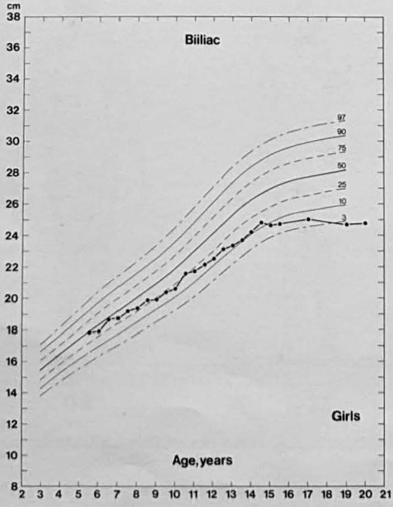












Normal Girl *Subject No. 37*

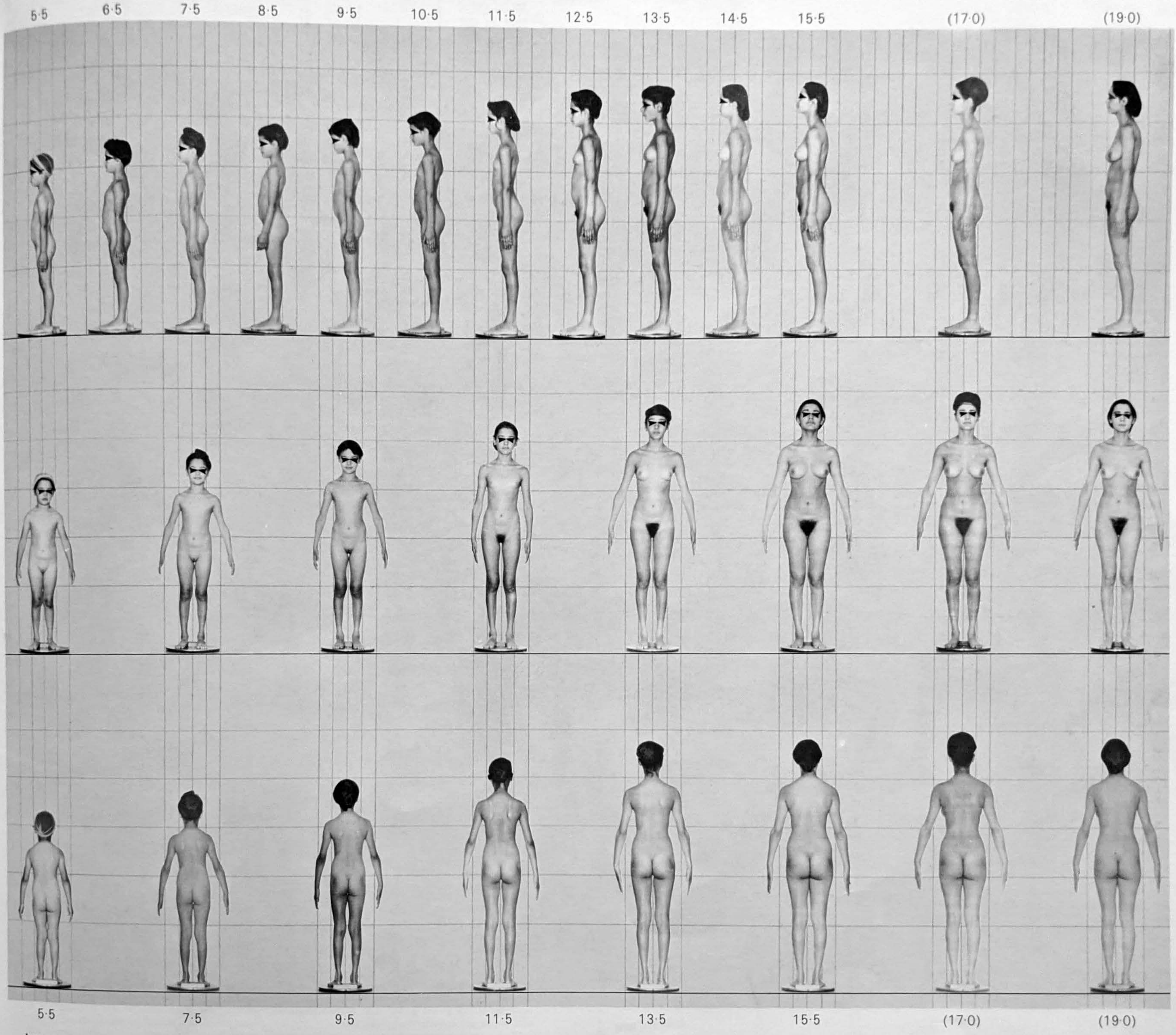
A fairly mesomorphic girl, rather low in endomorphy. She is small, with height centile falling from the 25th to the 10th partly before puberty and partly due to a spurt a little below average in effect. Peak height velocity reaches the 20th centile about a year earlier than average.

Sitting height and leg length have similar curves to height; both end at −1 SD.

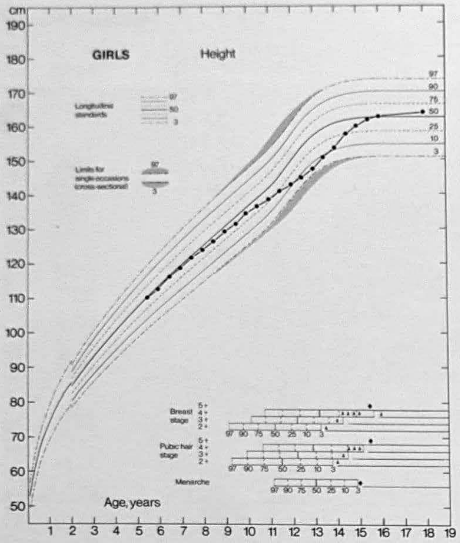
Biacromial diameter starts near the 50th, reaches it again during early adolescence and ends at the 15th centile. Biiliac diameter falls progressively through the centiles as growth proceeds, starting at the 50th and ending at the 3rd.

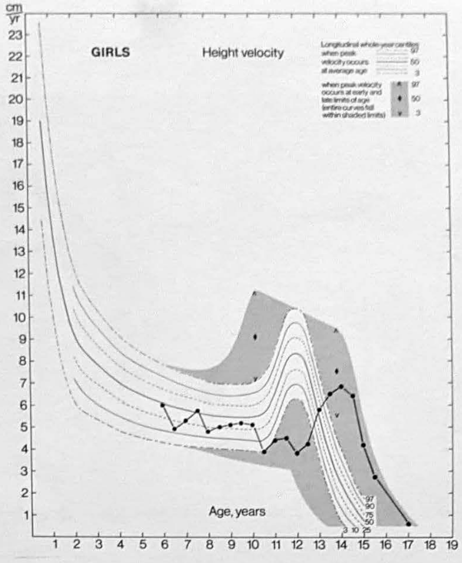
Weight is at about the 10th centile before puberty, but then falls to below the 3rd. Triceps skinfold is around the 10th centile until it drops sharply with weight loss from 15·5 to 19.

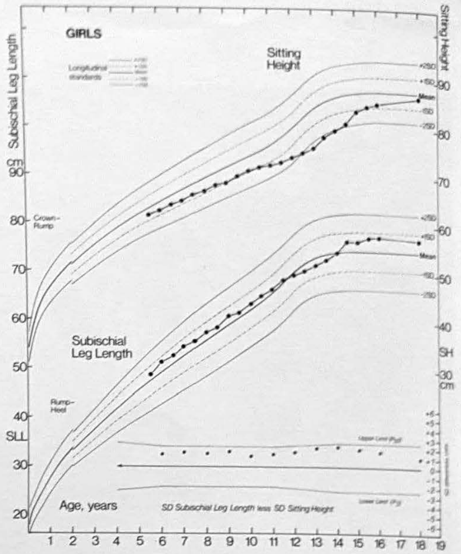
Bone maturity is a little ahead of average until the final stage of epiphyseal closure. It agrees, therefore, more with peak height than with menarche which takes place at 13·5 years. Breast development is early, agreeing with height, and pubic hair is earlier still. Menarche, therefore, is rather out of step with the other pubertal developments in this girl.

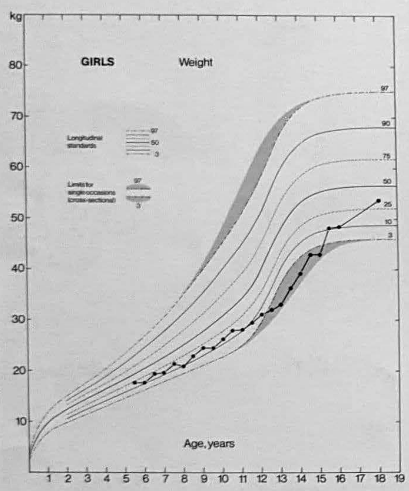


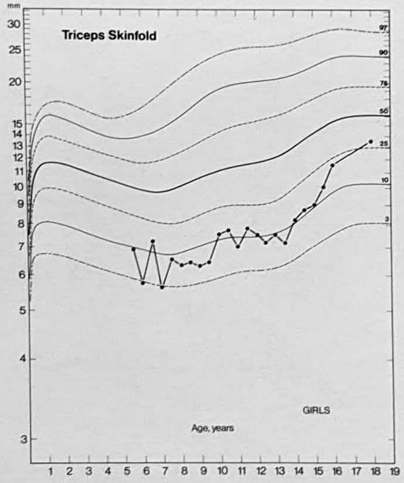
A small part-Indian girl of relatively high mesomorphy and low endomorphy, somatotype 3½34.

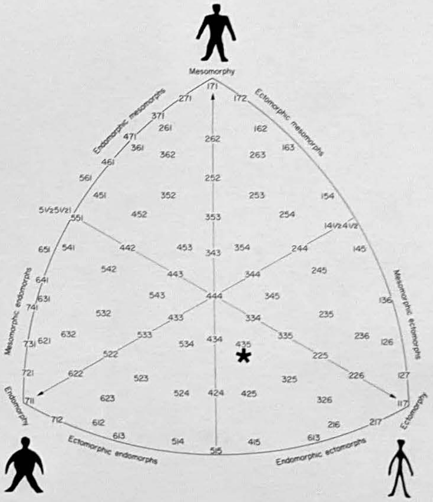


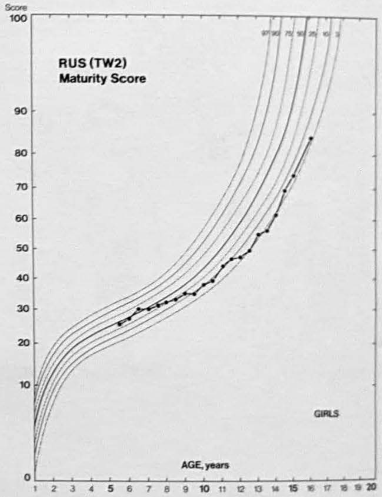


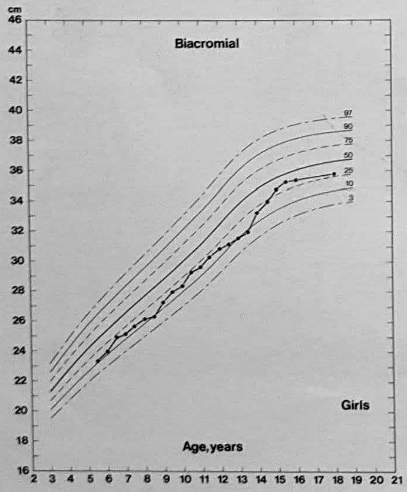


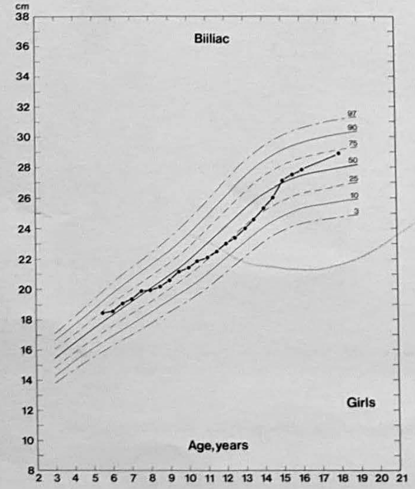












Normal Girl *Subject No. 38*

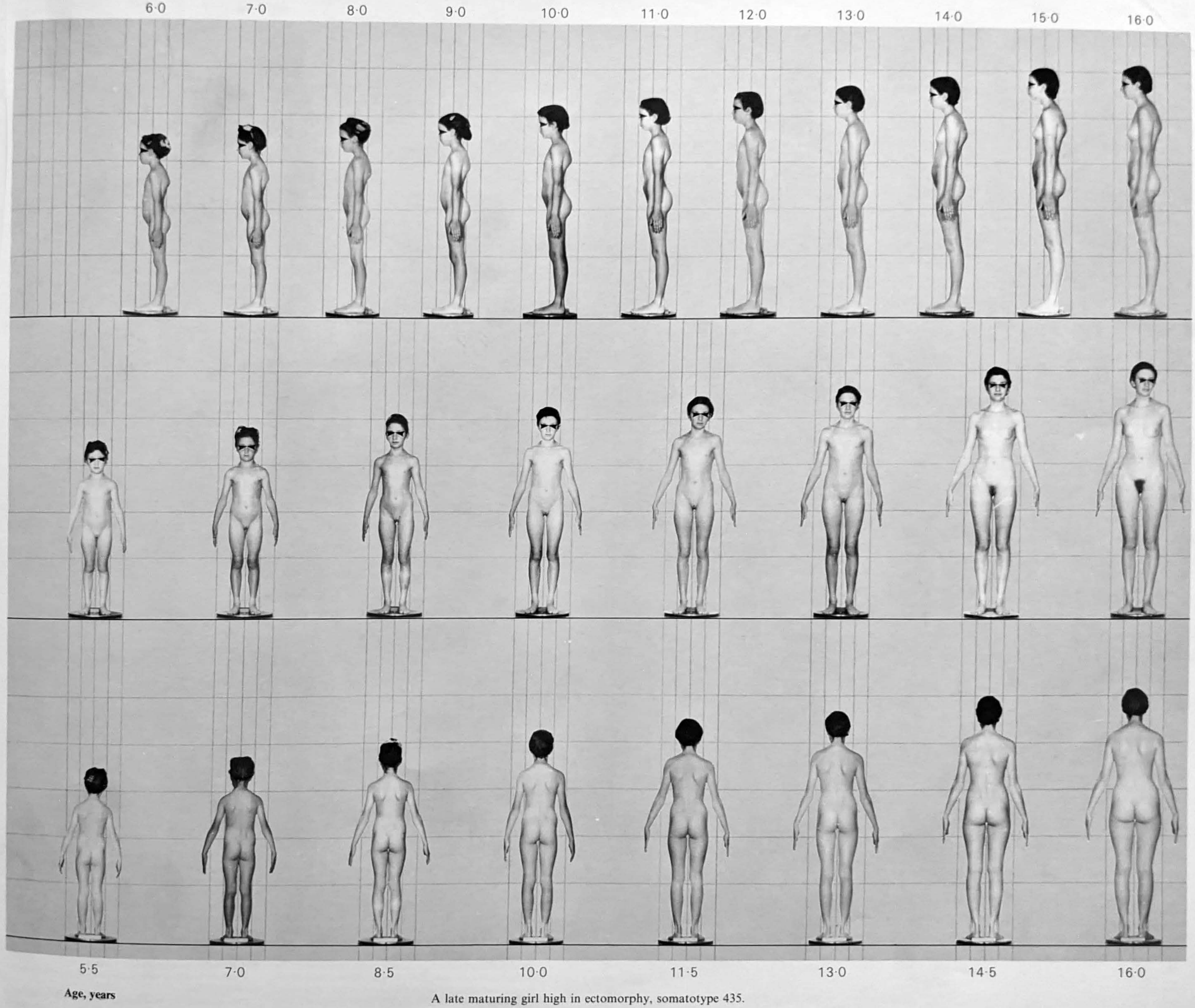
The most ectomorphic girl presented here, somatotype 435. She is of average height, 50th centile at 5·5 and 60th at 18, after dropping to the 5th centile because of a very late growth spurt. Peak height velocity occurs only at age 14·0, i.e. 2 SD late, and reaches the 35th centile. Menarche is also 2 SD late, occurring at 15·0 (a late growth spurt is characteristic of ectomorphic girls and ectomorphic boys also).

The legs are long relative to the trunk, as is usual in persons high in ectomorphy. Leg length begins and ends at about +0·8 SD, and sitting height begins at −0·6 and ends at −0·2 SD. Leg length is near the upper limit for sitting height.

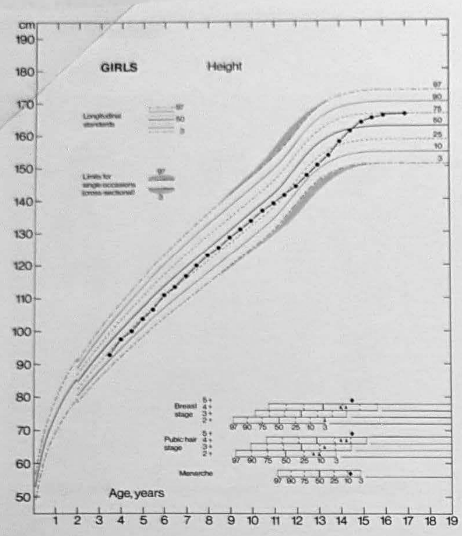
Biacromial diameter is initially at the 10th centile and finally at the 25th. Biiliac diameter is initially at the 50th, but drops steadily to reach the 25th at the beginning of the spurt, whence it rises to about the 65th. Weight follows the 10th centile till puberty when it falls to below the 3rd due to the late spurt. It then catches up to the 10th at 16 and 30th at 18. Triceps skinfold is around the 10th till the end of puberty; between 15 and 18 it rises to the 25th. Bone maturity score is initially at the 50th, but falls steadily to reach the 3rd at puberty, in agreement with peak height velocity and menarche, and also with breast development and pubic hair stages.

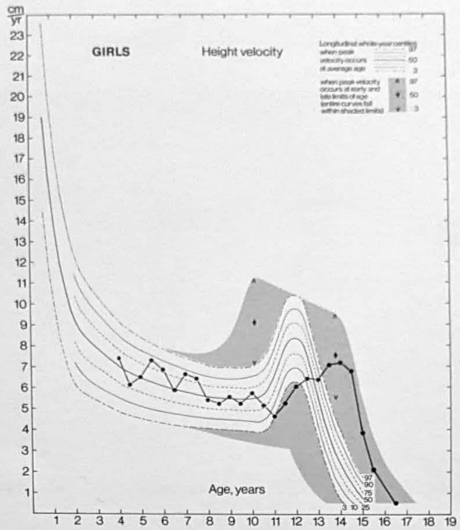
Normal Girl

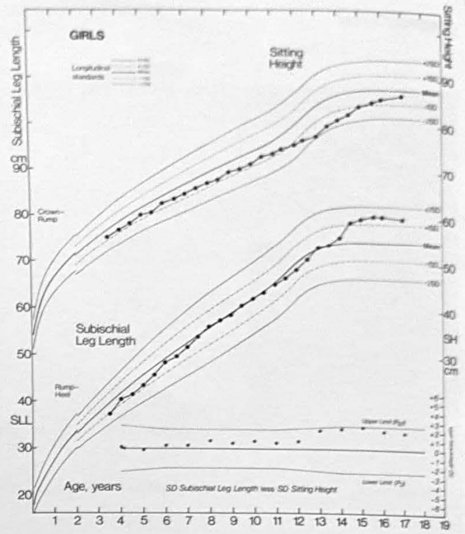
Subject No. 38

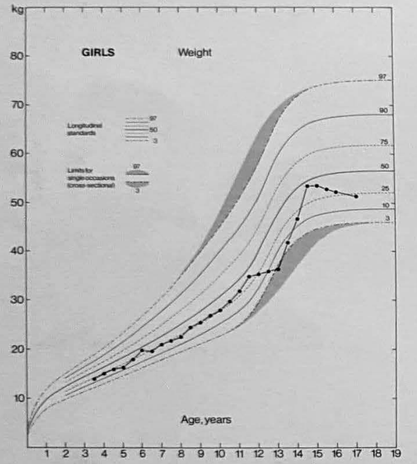


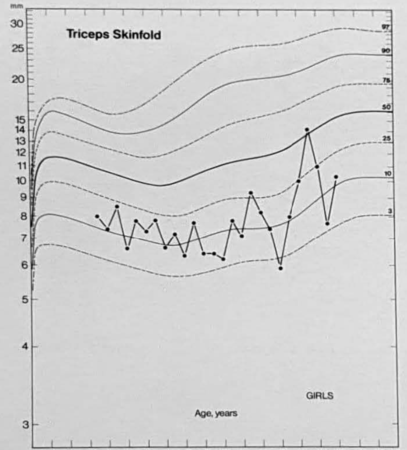
A late maturing girl high in ectomorphy, somatotype 435.

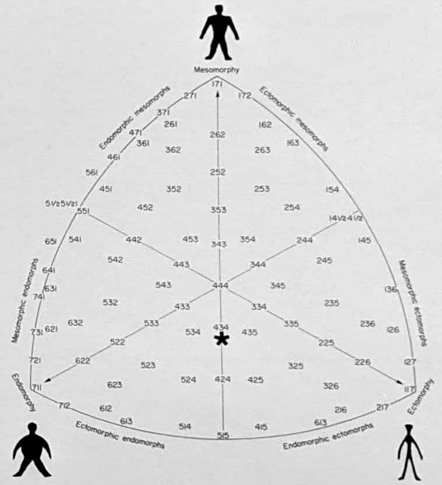


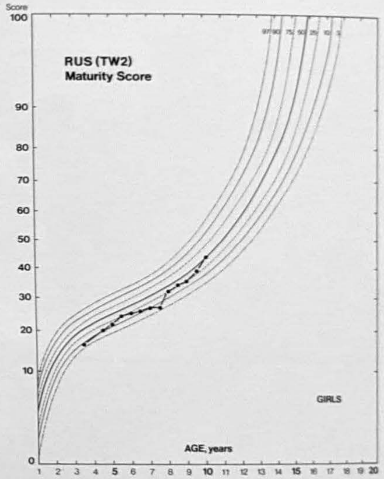


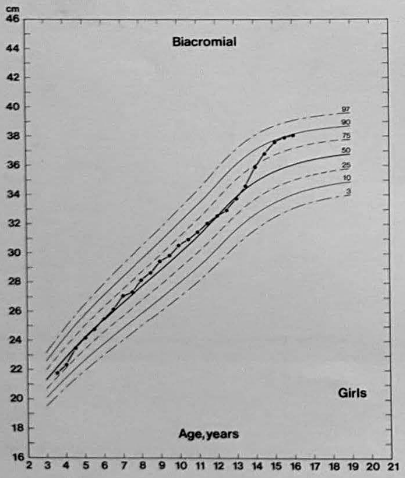


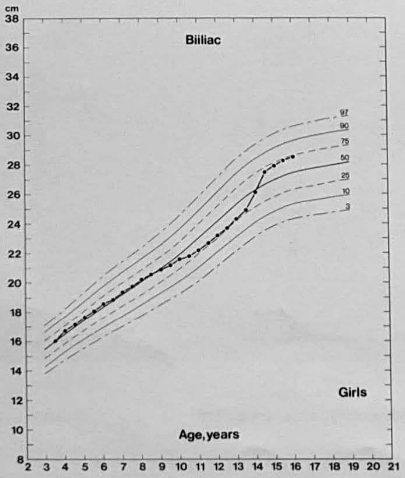












Normal Girl *Subject No. 39*

A second girl relatively high in ectomorphy, with a strong mesomorphic component also. She is a large girl, with height initially at the 25th but ending at the 75th due to an above-average adolescent spurt. The spurt is late and by the time it begins height has fallen to nearly the 10th, from which the spurt brings it to the 75th. Height velocity remains steady around the 50th to 60th centiles till puberty; the peak, 2 years late, scarcely reaches the average value for this age but the duration of the spurt is considerably greater than average. The average curve has an interval of 3 years between take-off and the symmetrical point on the descending portion of the curve. This subject's velocity curve spreads out to 4 years.

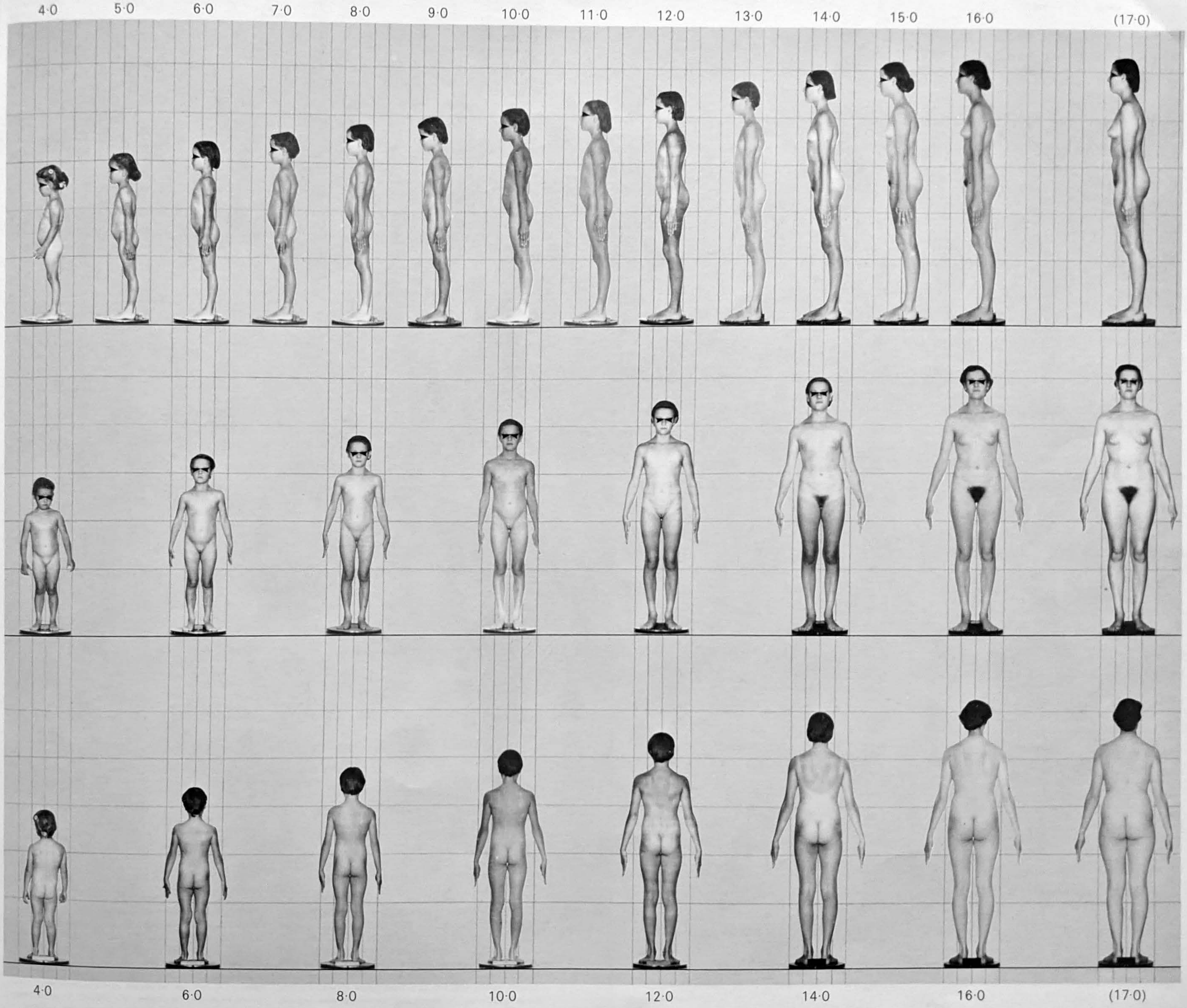
Sitting height and leg length also have prolonged spurts. At first the relationship between the two is average, but sitting height falls through the centiles while leg length rises. At 13 the difference between the SD scores is +2·0 and at maturity it is still +1·8, close to the upper limit.

Biacromial diameter shows the same large rise at adolescence as height, going from the 50th centile to end at the 90th. Biiliac does the same, rising from the 50th to the 75th.

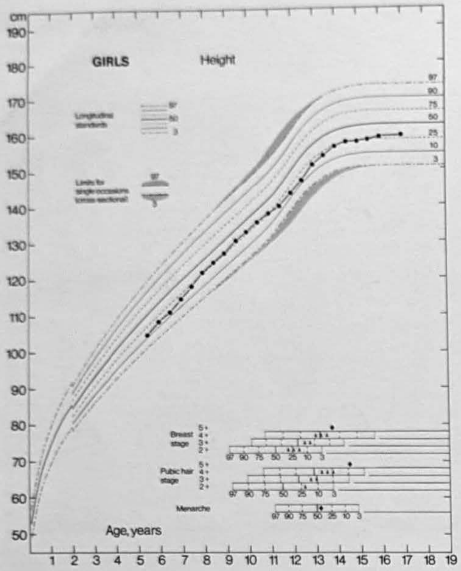
Weight is mostly around the 25th, though there is a steep rise at about the time of maximal height spurt followed by a drop thereafter. Triceps skinfold reflects the same rise and fall.

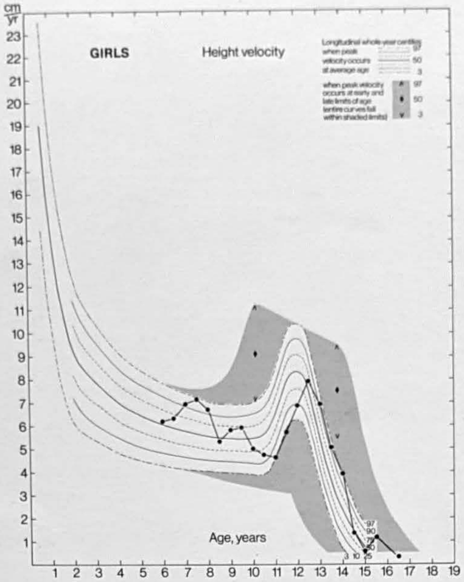
Menarche is at 14·4 years and breast and pubic hair stages are similarly late.

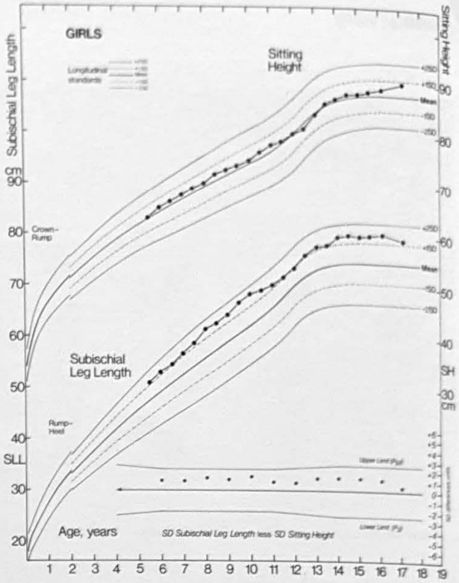
The pictures show the marked growth spurt well and the way the rather slender physique at age 14 (or 13 in side view) thickens to the more solid build seen at 17.

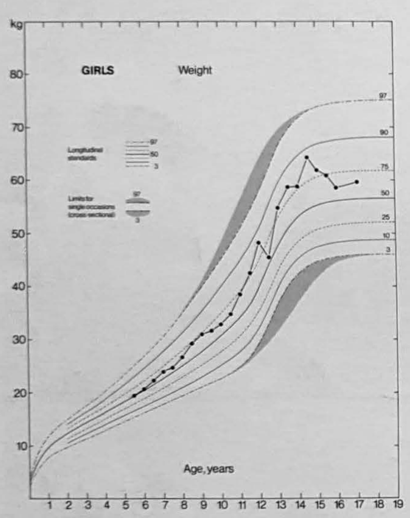


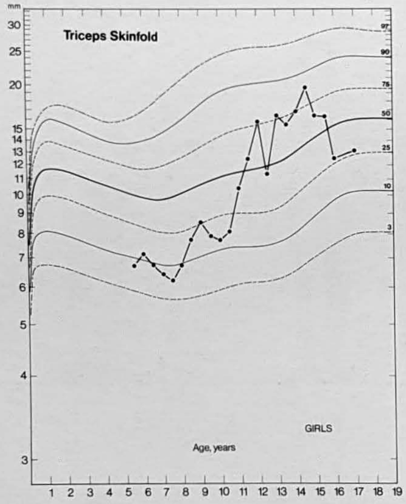
A girl high in both ectomorphy and mesomorphy, somatotype 434, with an adolescent growth spurt much above average.

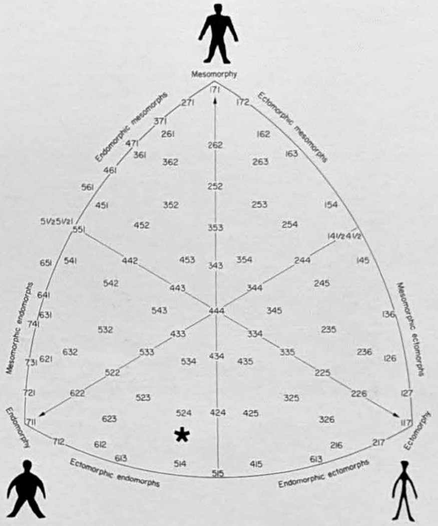


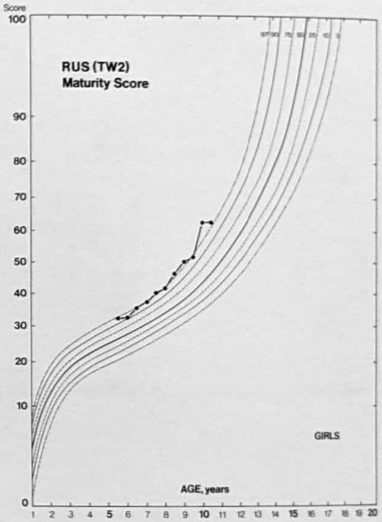


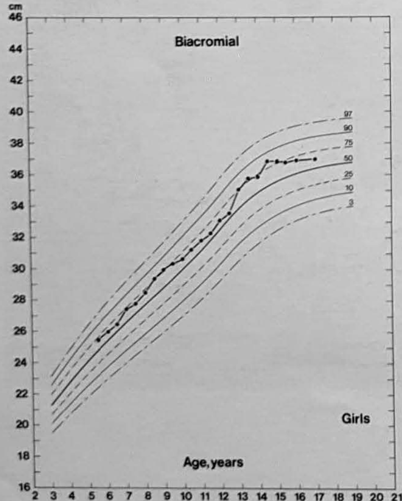


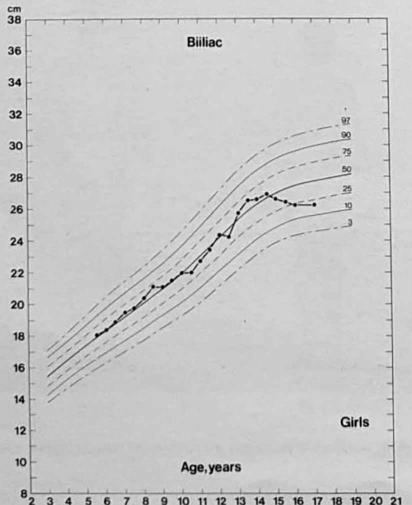












Normal Girl *Subject No. 40*

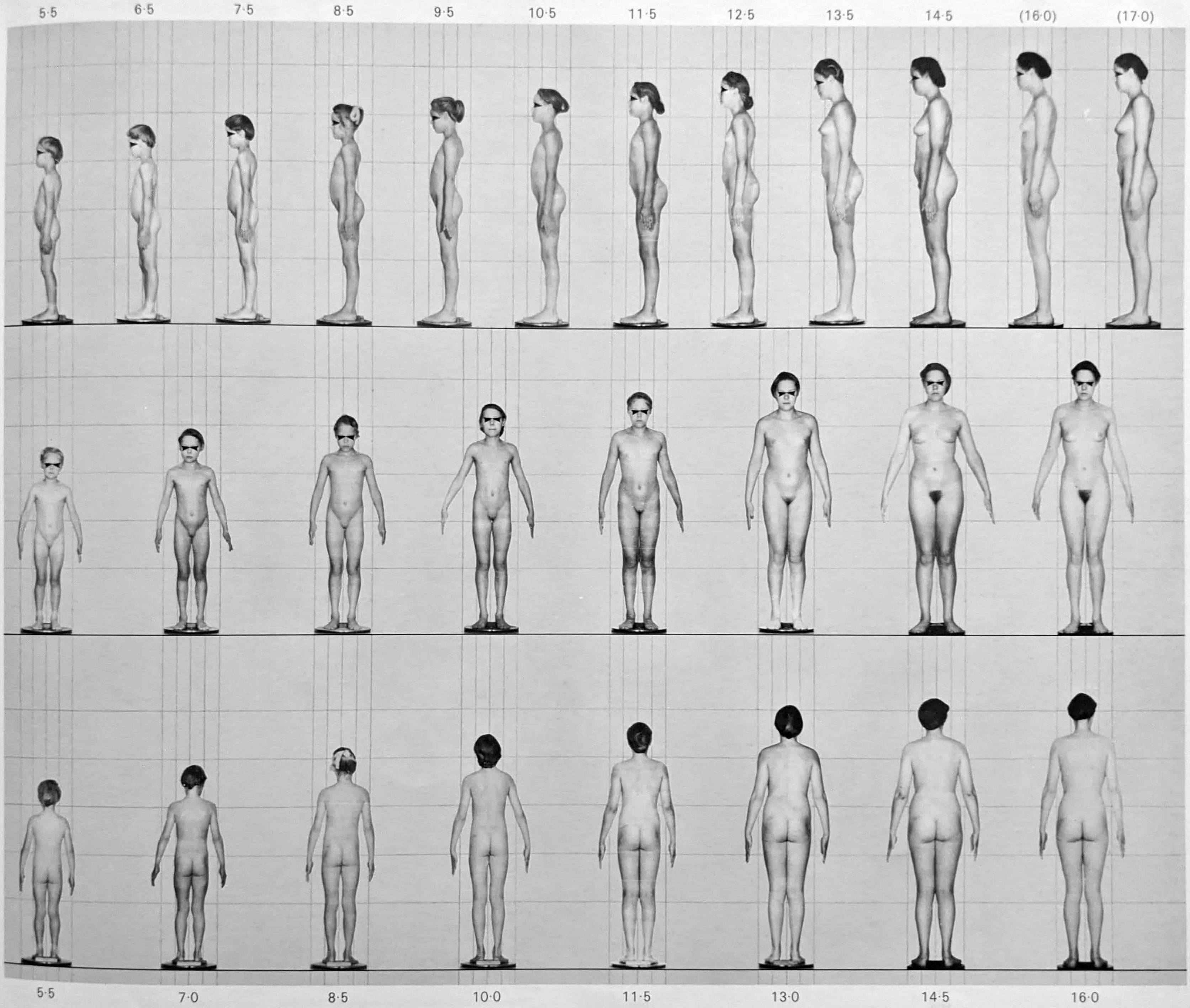
A contrast in physique to the preceding subject; the degree of ectomorphy is the same, but of mesomorphy very different. Height rises from the 10th to the 25th centile in the early years and then remains there. Height velocity shows a period of increased growth from 6·5 to 8·5, or perhaps really a catch-up from 5·5 to 8 followed by a gradual and quite usual decline in velocity centile from 8 to 11·5. Peak height velocity is a little lower than average, at shortly after the average time. Legs are throughout relatively long, as in most predominantly ectomorphic girls. Sitting height is mostly at the 50th centile, except for the final value, and leg length is at about the 90th centile.

Biacromial diameter is initially and finally at the 60th and biiliac is initially at the 50th but finally at the 20th.

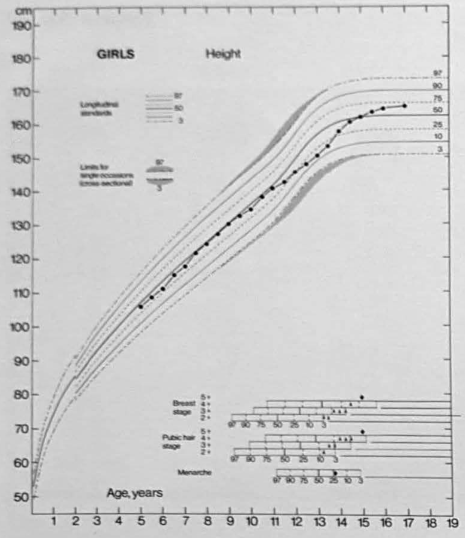
Weight stays between the 50th and 75th centiles, but triceps skinfold rises steadily from the 10th to the 75th and then declines from 14·5 years on.

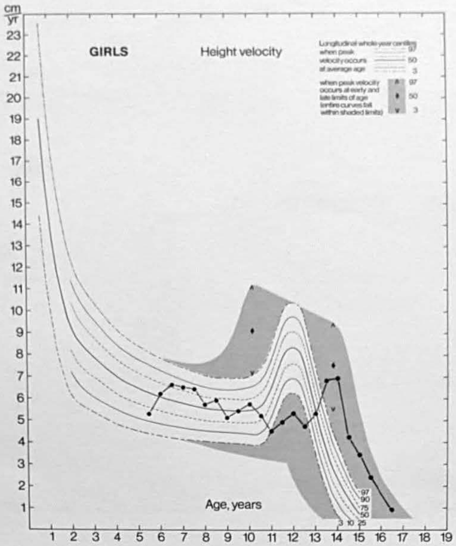
Bone maturity is surprisingly advanced, being at the 97th from 5·5 to 10·5, but we do not have a bone maturity score available at 10·5 so cannot tell whether or not a sharp retardation occurred from then on; it seems very probable.

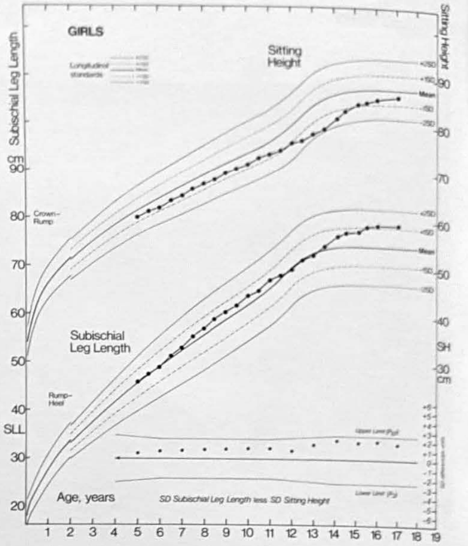
Breast and pubic hair stages are reached a little later than average, in agreement with menarche and peak height velocity.

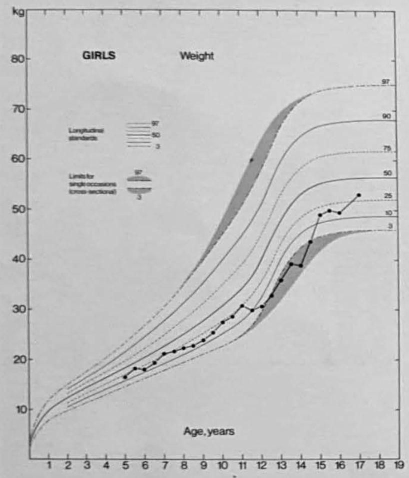


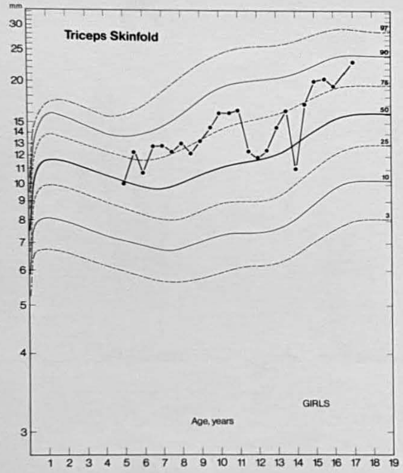
A predominantly ectomorphic girl with very little mesomorphy, somatotype 51½4.

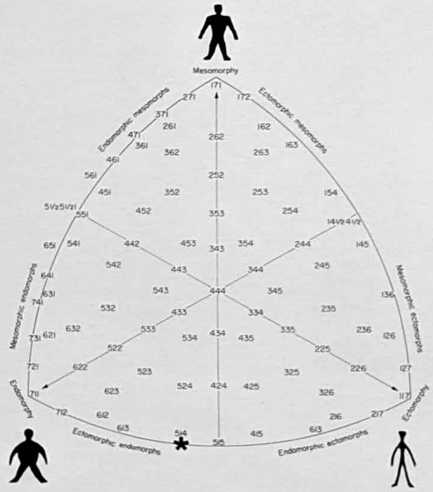


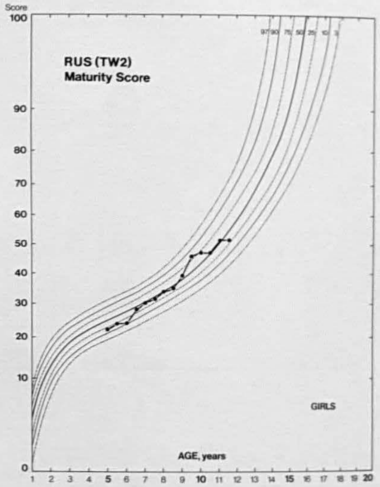


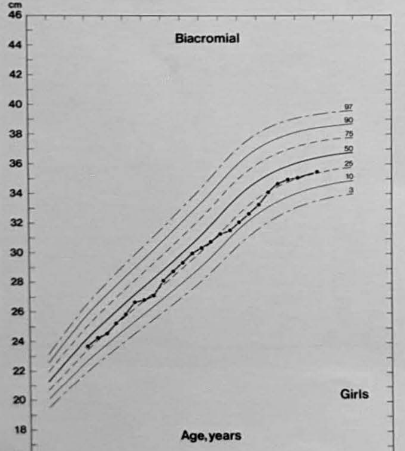


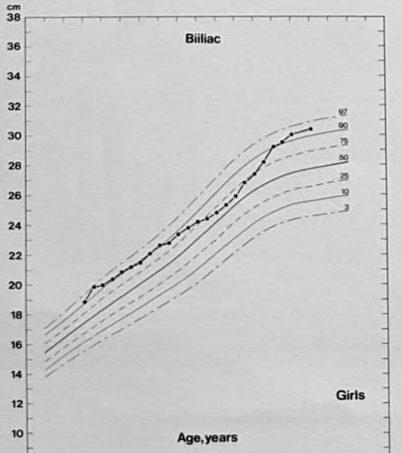












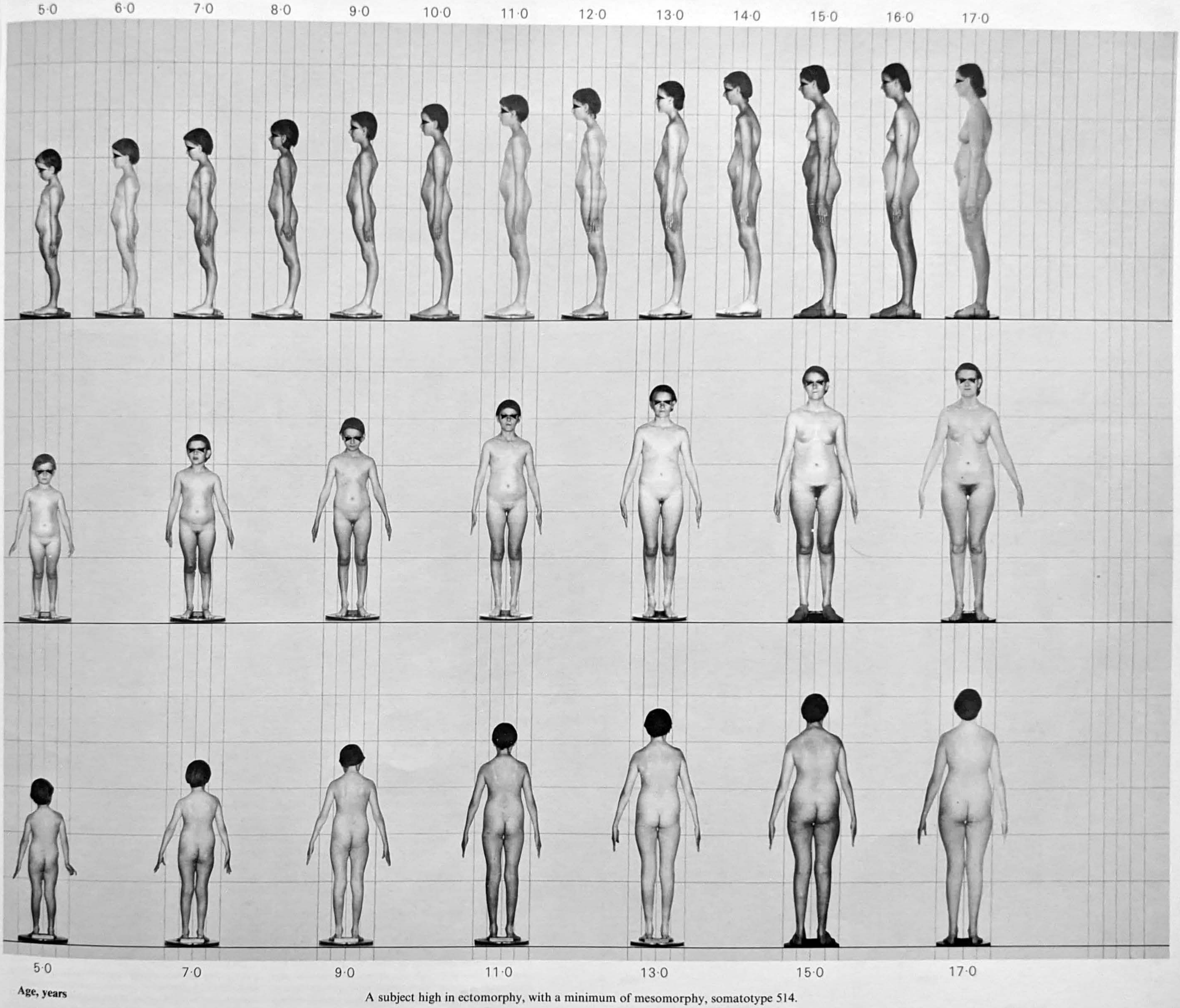
Normal Girl — *Subject No. 41*

Another girl high in ectomorphy, but with even less mesomorphy than the preceding subject. She is a little above average height. The first height velocity is low, but after that height velocity remains in the 25th–75th band if late maturity is allowed for; peak height reaches about the 40th centile, but occurs 2 years late. The legs are long, the SD score rising from 0 initially to +1 at maturity, with sitting height beginning and ending at −0·4 SD.

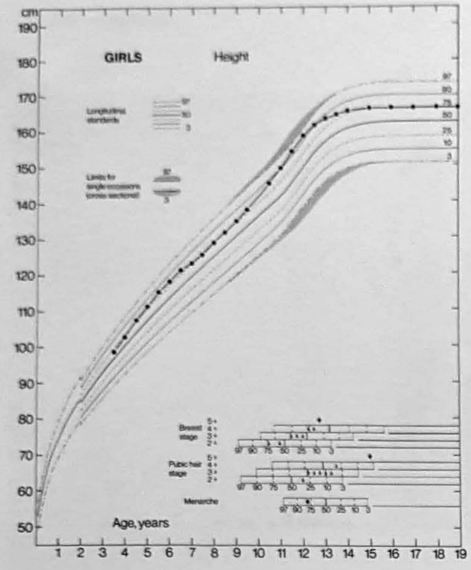
Biacromial diameter remains low, at about the 25th centile throughout. Biiliac diameter, on the other hand, is relatively high, being initially and finally a little above the 90th centile. Weight is initially at the 25th, and again there after puberty. Triceps skinfold is at about the 75th centile except for a period of fat loss between 11·5 and 12·5 and a sudden fall at 14·0 (not a measurement error as it occurred also in subscapular, biceps and suprailiac skinfolds, not illustrated here).

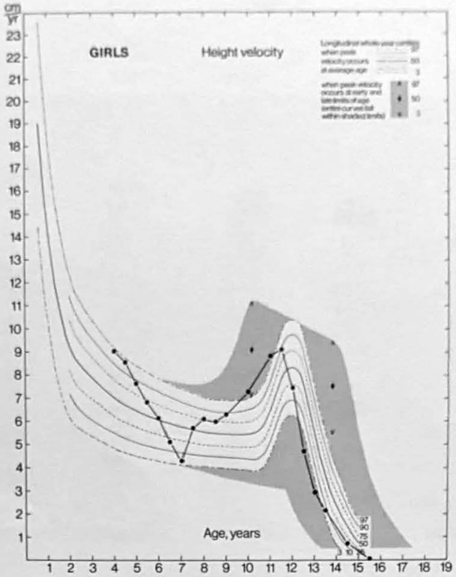
Bone maturity is at about the 50th centile from 6·5 to 11·5, when our records cease. Peak height velocity is reached 2 years later than average, whereas menarche, at 13·8, is less than 1 year late. In consequence menarche, most unusually, coincides with peak height velocity, instead of being later. Breast and pubic hair stages both agree with peak height velocity rather than with menarche.

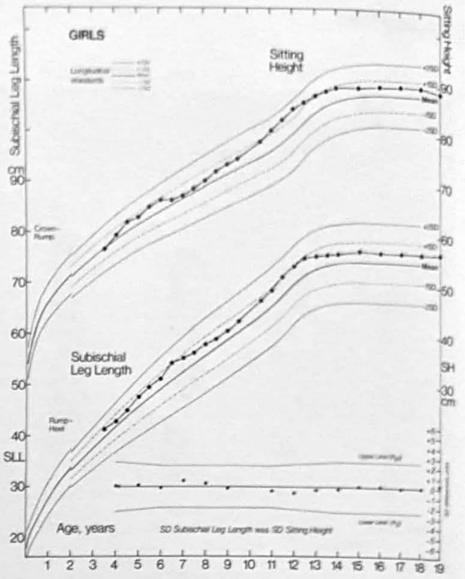
The pictures show the pear-shaped physique resulting from the low biacromial diameter, high biiliac diameter, long legs and more than adequate skinfolds.

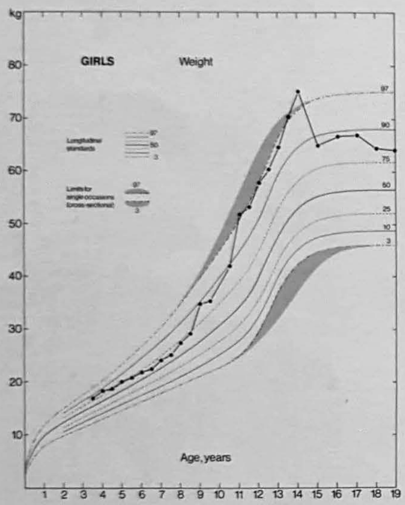


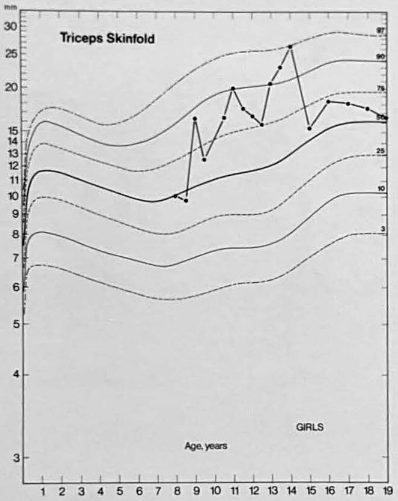
A subject high in ectomorphy, with a minimum of mesomorphy, somatotype 514.

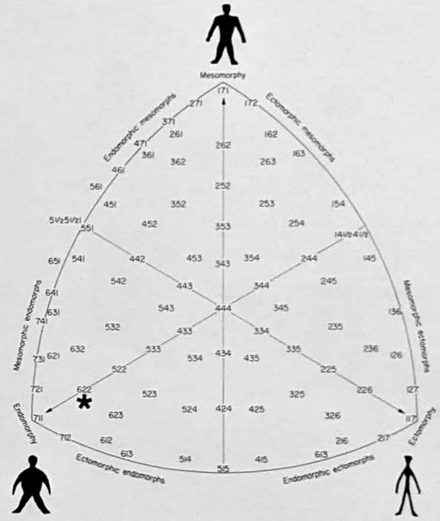


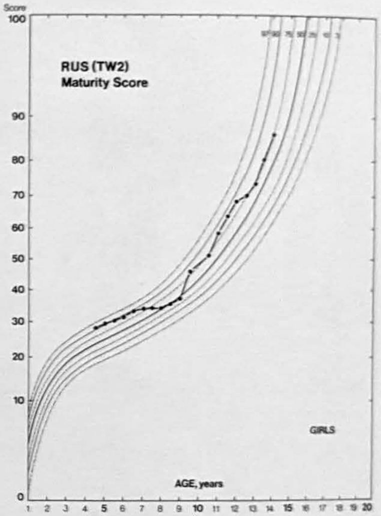


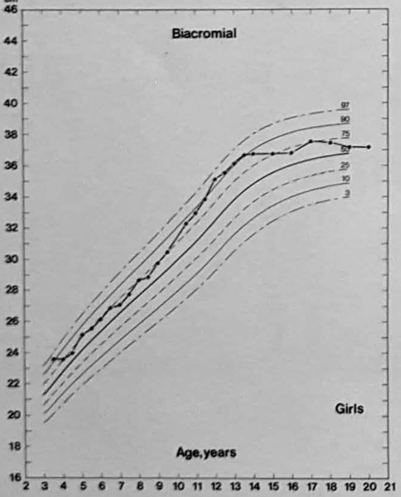


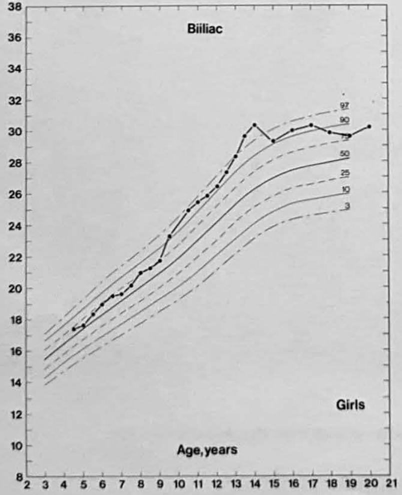












Normal Girl

Subject No. 42

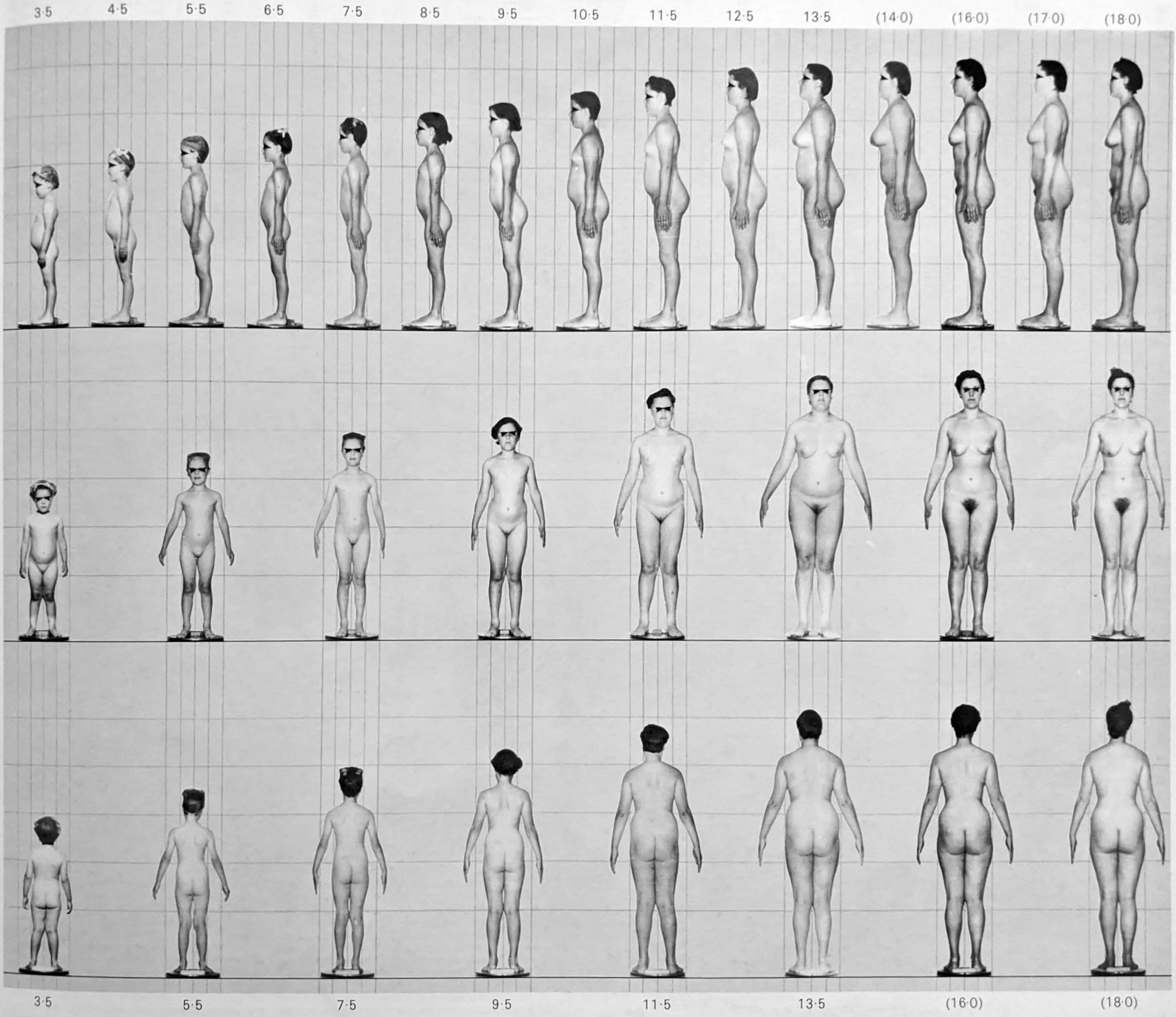
The first of our nine predominantly endomorphic girls, somatotype 622. She is a large girl; height is initially and finally at the 75th centile, increasing to nearly the 97th during her early adolescent growth spurt. Menarche was at 12·2 years which is typical for girls of this degree of endomorphy. The height velocity curve is curious. There is a consistently above-average deceleration to start with, taking the velocity down from the 97th to the 3rd centile at age 7, followed by a rise which merges with the spurt. Alternatively, one could read this chart as signifying a somewhat high velocity initially with a marked check from 6·0 to 7·5 years (visible in the height distance and sitting height charts) followed by a catch-up. This is probably the true explanation, in that this subject was quite seriously ill with measles and scarlet fever during this year. The check also occurs in skeletal maturity and is perhaps visible in weight. A problem arises over the take-off for the spurt; it may be as early as 7·0 (see velocity plotted at 7·5) or not till age 8·0 (see velocity at 8·5). The latter would give the usual 3-year breadth to the spurt and this is added evidence that the earlier high velocity is a catch-up. The adolescent peak is reached 6 to 9 months before average and is at the 75th centile. Sitting height and leg length are in average proportion.

Biacromial diameter is mostly around the 75th centile, though it ends at the 60th. Biiliac diameter is initially at the 75th, rises to above the 97th (undoubtedly being contaminated by immovable fat pads over the hips) and ends a little below the 90th.

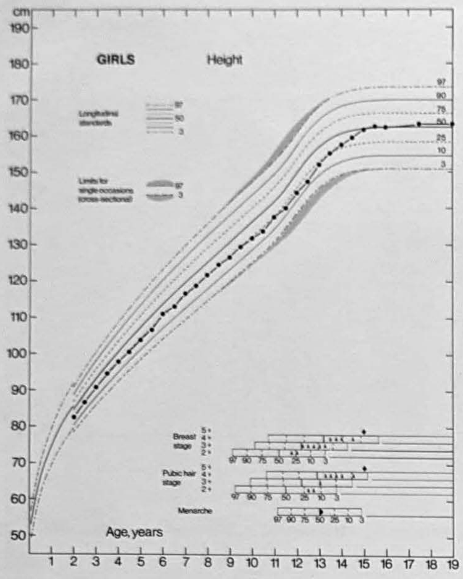
Weight shows a marked gain from 7·5 to 14 years, going from the 60th centile to above the 97th. Triceps skinfold shows the same type of curve (early values are missing because the measuring instrument was developed during the course of the study and this girl was one of the earliest entrants). From 14 to 19 years weight diminishes to the 80th centile.

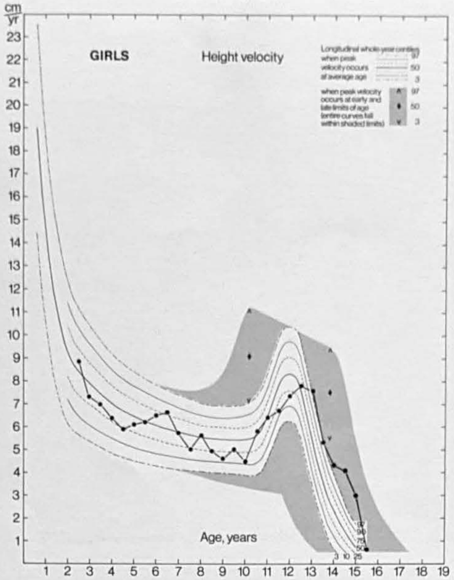
Bone maturity is initially at the 90th centile but advances slowly so that by 8 years it has fallen to the 50th. It then rises to and stays at the 75th, a value quite consistent with age at peak height velocity. Menarche was at 12·2 years. Breast development agrees closely with menarche in timing, but pubic hair is considerably delayed. The discrepancy between the two sequences is striking; one averages the 60th centile in timing, the other the 30th.

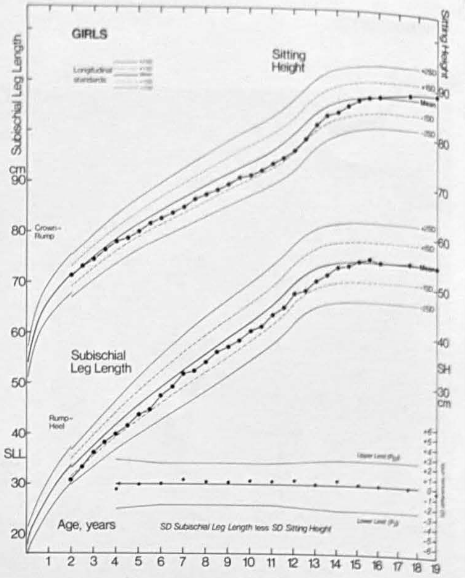
The pictures show the early rotundity of the predominantly endomorphic girl with a rather massive thickening developing from 9·5 to 14. Dieting produces a considerable change of contour from 14 to 16 and by 18 the tendency to obesity has been firmly checked. The severe genu valgum seen at 3·5 gets better gradually, though it does not entirely disappear.

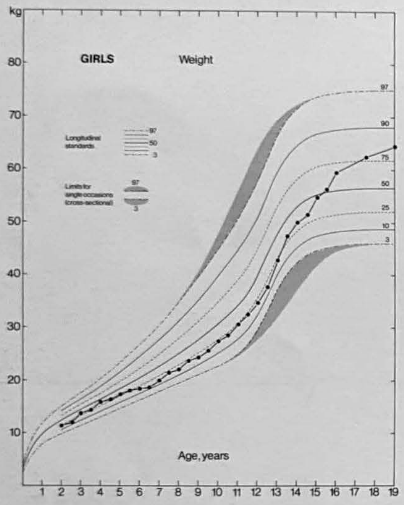


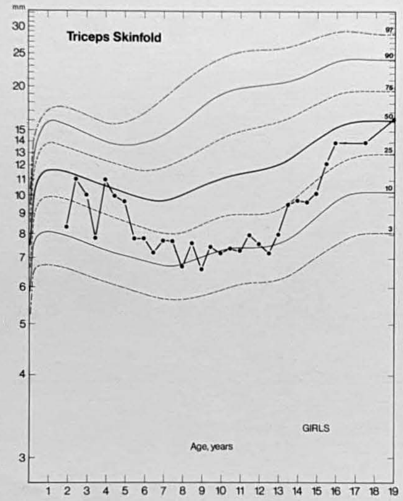
A predominantly endomorphic girl of above average size, somatotype 622.

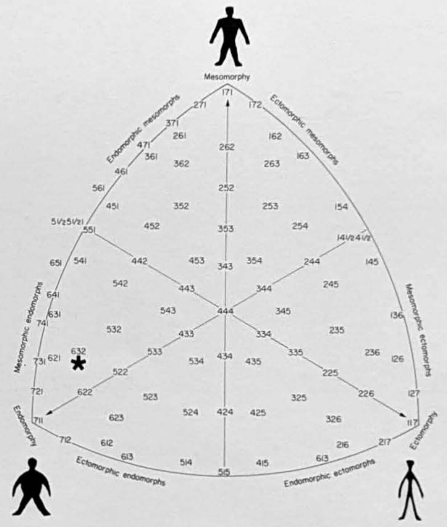


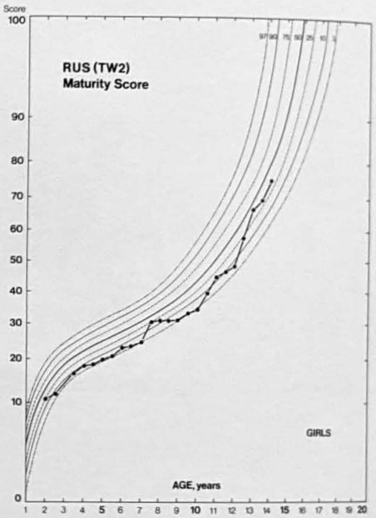


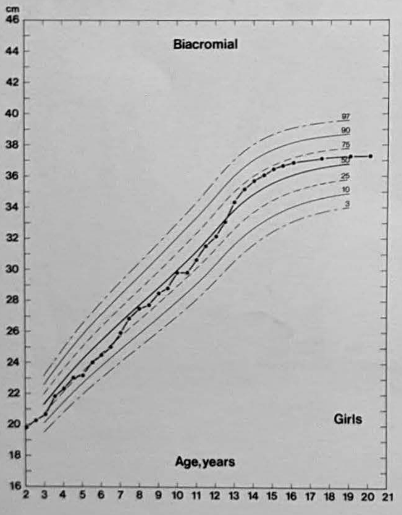


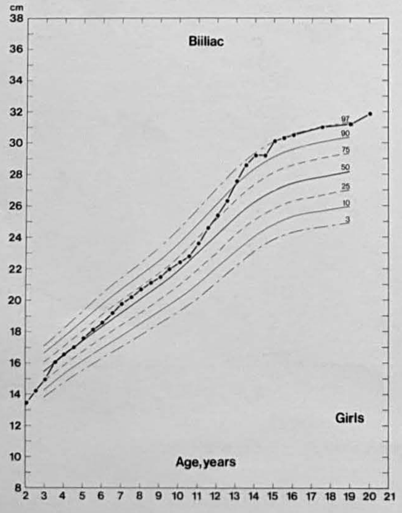












Normal Girl

Subject No. 43

A girl of somatotype 632, a not uncommon somatotype in women. Height rises from the 25th to the 50th centile at puberty due to a spurt of average peak velocity, but greater than average duration. Height velocity is mostly at the 25th centile except for a period of rather faster growth from age 5 to 7 (the excess velocity being entirely in leg length). Peak height velocity is reached slightly after the average time, and menarche is at exactly the average age at 13·0 years. Sitting height and leg length are in average proportion.

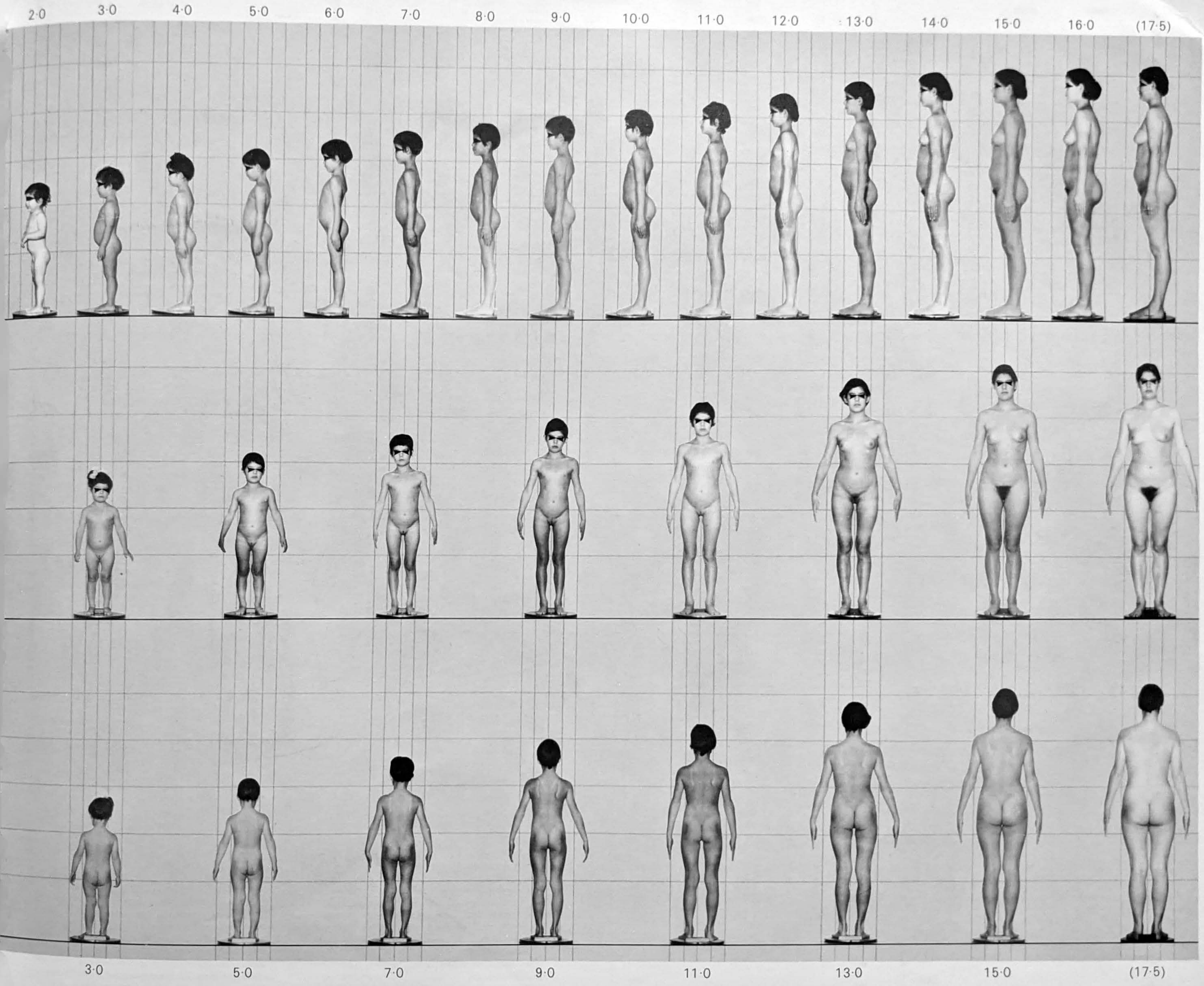
Biacromial diameter (note that it is quite measurable at age 2) rises gradually from the 25th to the 60th centile. Biiliac diameter, at first small, rises to the 50th at age 3·5 and then at puberty ascends to the 97th, partly due to fat. Weight is at the 25th right until 13, but then gets out of control and rises to the 80th at 19. Triceps skinfold is mostly between the 10th and 25th, but from 13 onwards also rises, ending at the 50th.

Bone maturity is at first at the 10th centile, but at age 10 begins to rise and by 13 is near the 50th, agreeing with age at menarche. In consequence there is an unusually large change in the predicted adult height. The prediction from age 10 is 165 cm, but from age 13 it is 159 cm; the actual adult height attained is 163 cm. In this instance (though not in all) prediction from bone age only, ignoring chronological age, works better, for the prediction from 10 years chronological is 162 cm and from 13 years chronological 163 cm. Breast and pubic hair stages are all delayed compared with menarche.

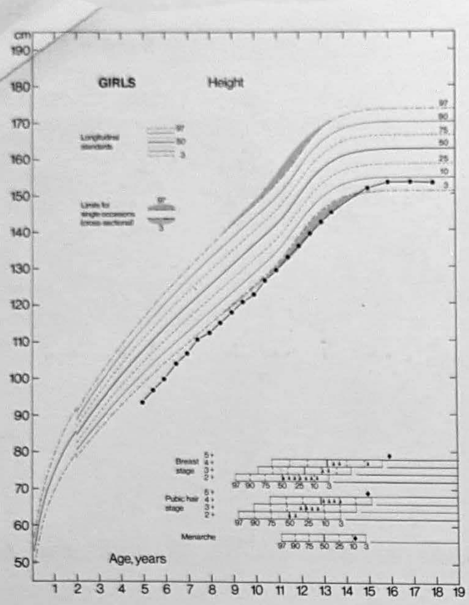
The pictures show the endomorphic physique already at age 3; indeed little change takes place in shape, as can be seen by comparing back views at 3 and 17·5. There is considerable lordosis, which is persistent.

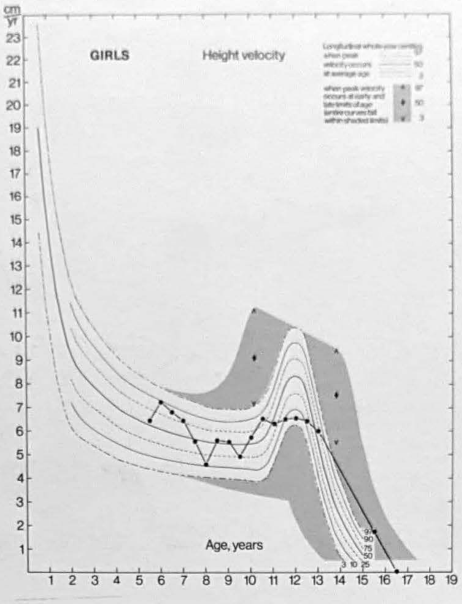
Normal Girl

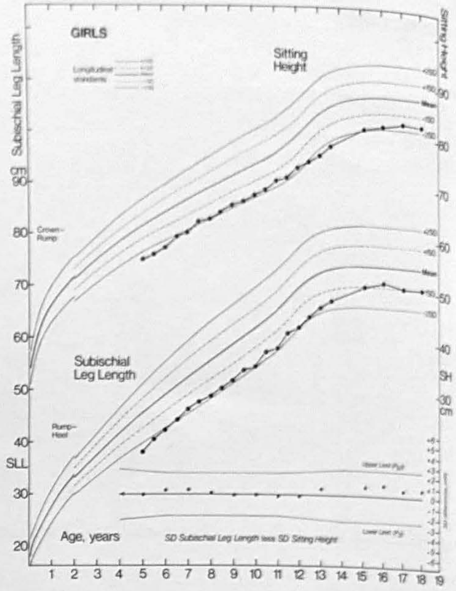
Subject No. 43

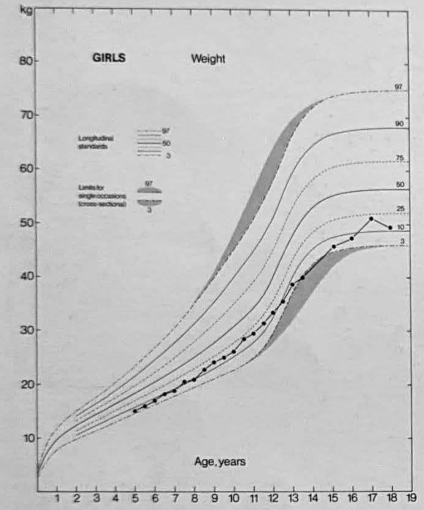


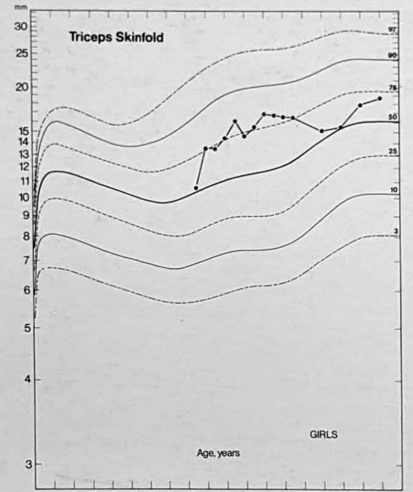
A predominantly endomorphic girl, somatotype 632, of average size.

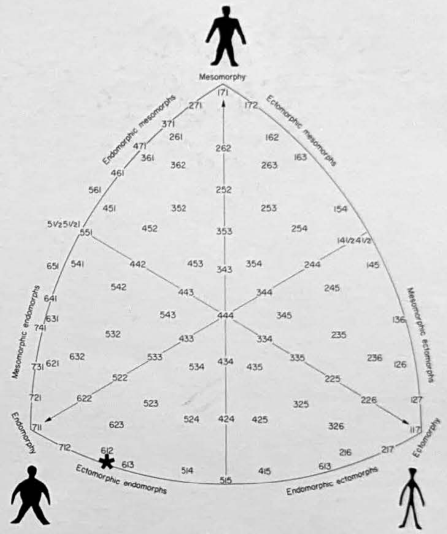


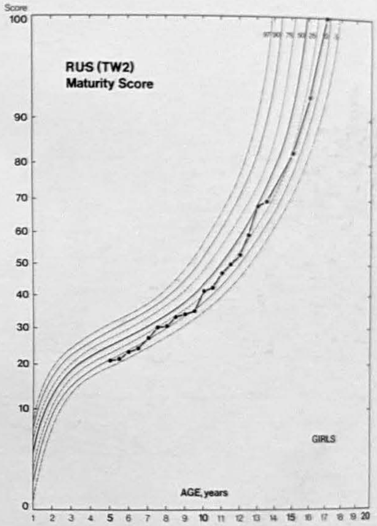


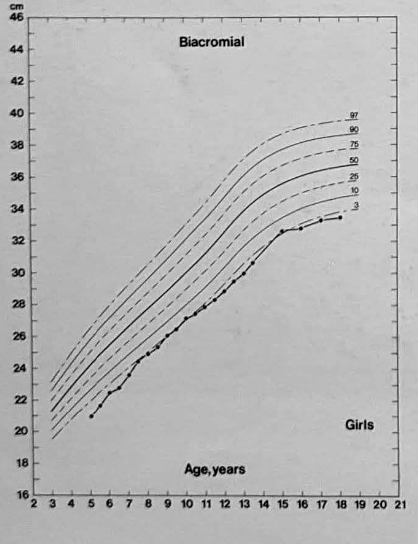


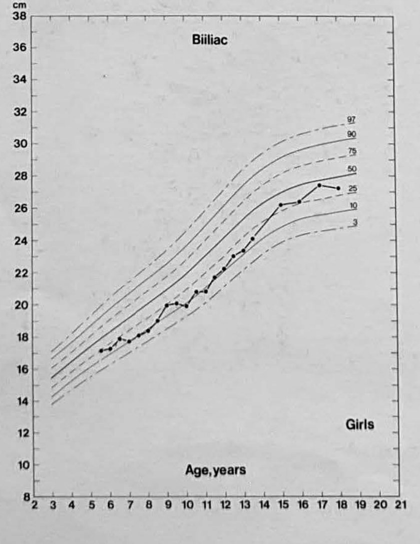












Normal Girl

Subject No. 44

A girl high in endomorphy and low in the other two components, somatotype 612. She is small, with height initially below the 3rd centile and ultimately at the 5th. Her height velocity curve shows an adolescent growth spurt which only reaches the 5th centile, but is much more prolonged than average; thus she maintains and indeed increases her height centile during the spurt. Menarche, at 14·4 years, is particularly late for such an endomorphic girl.

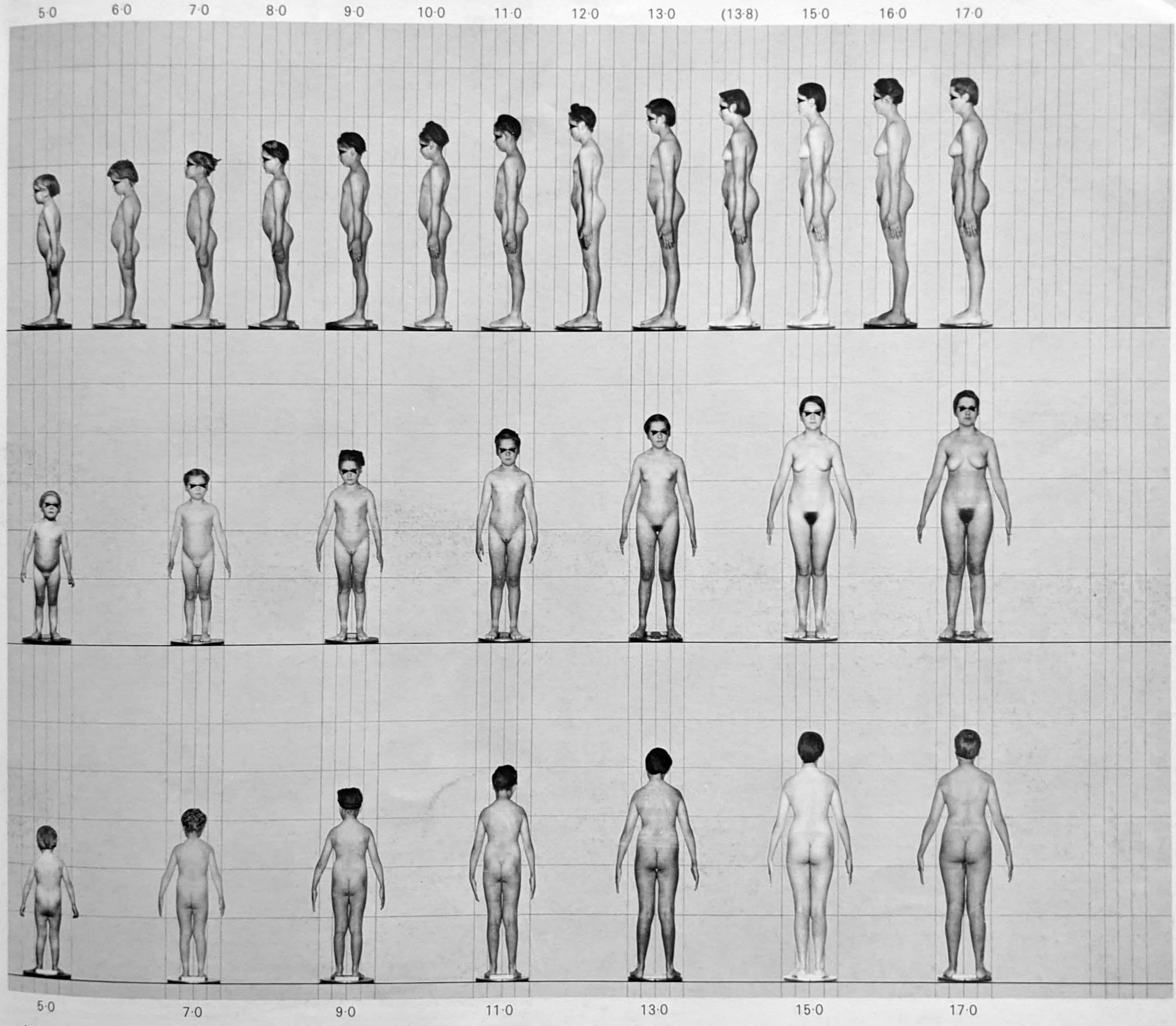
Sitting height and leg length are in about average proportion until puberty. The sitting height spurt is very small, while the legs keep growing steadily. In consequence at maturity the legs are relatively long, with an SD score of − 1·0 compared with an SD score of − 1·8 for sitting height.

Biacromial diameter follows height except that it ends where it started, a little below the 3rd centile. Biiliac is relatively larger, starting and ending at approximately the 25th centile.

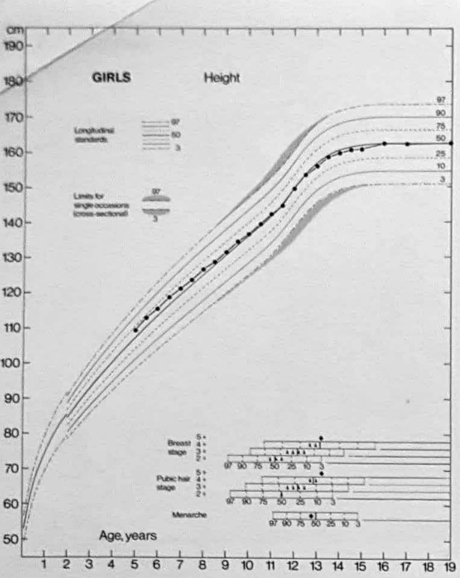
Weight is initially at the 5th centile and rises to the 10th at age 18. Triceps skinfold is mostly around the 75th centile.

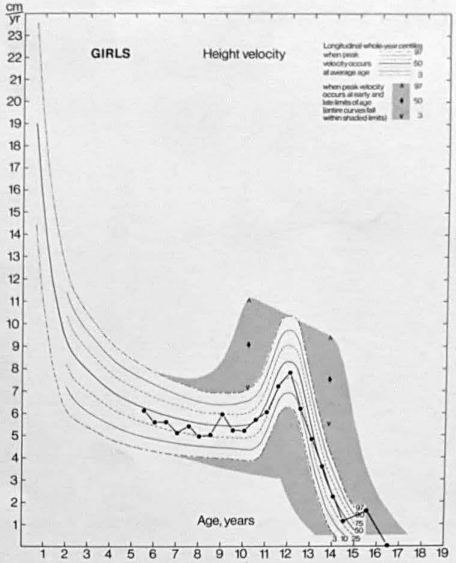
Bone maturity is usually between the 10th and 25th centiles, in good agreement with age at menarche. Breast development is equally late, but pubic hair development less so.

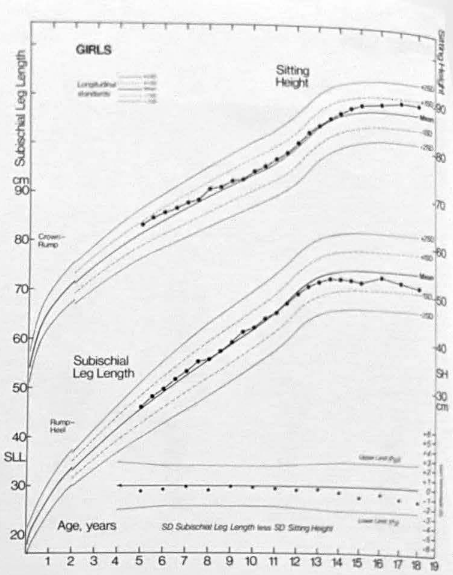
The pictures show hyperextension of the knees throughout. Genu valgum seems to develop increasingly from 5 to 13 and is still present at age 17.

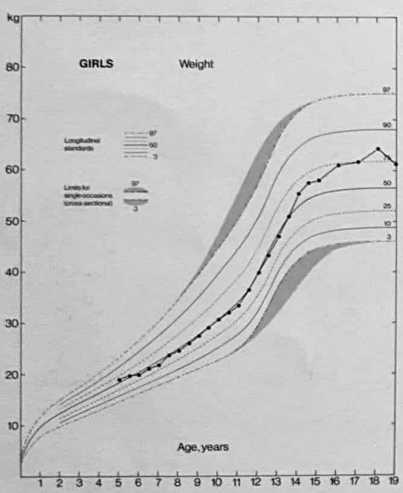


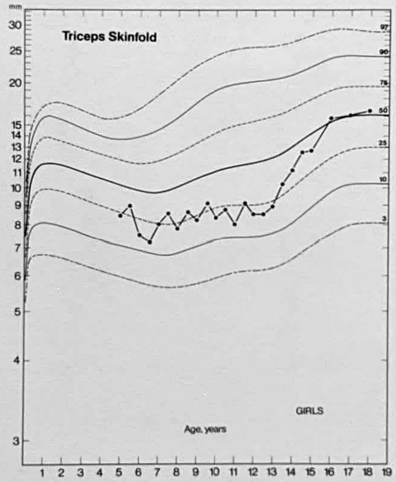
A small, endomorphic girl, somatotype 612, with an unusually flat and prolonged adolescent height spurt.

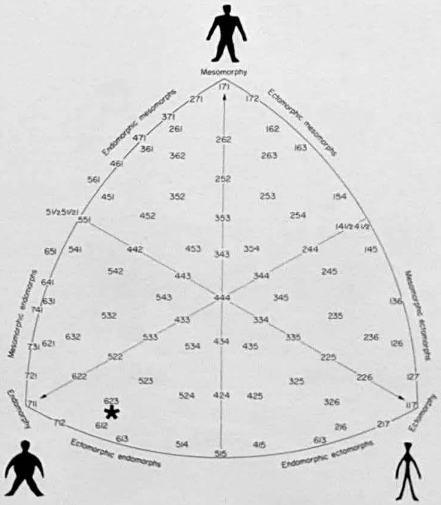


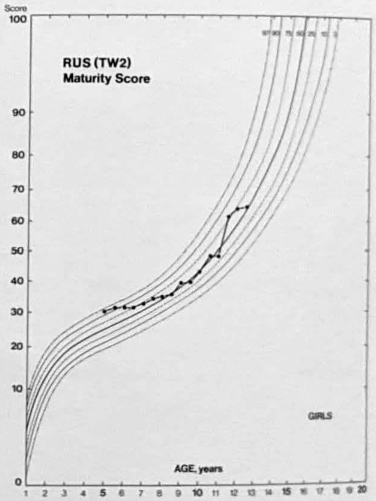


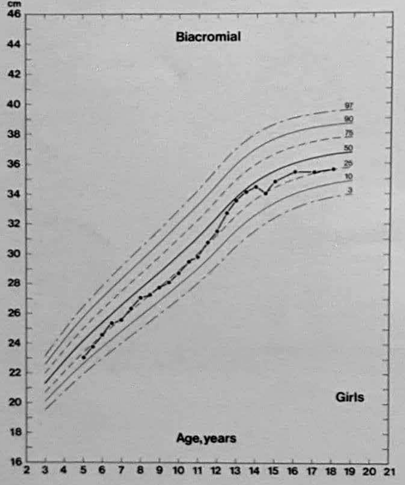


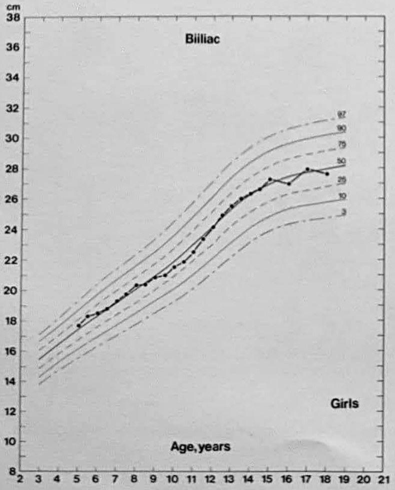












Normal Girl *Subject No. 45*

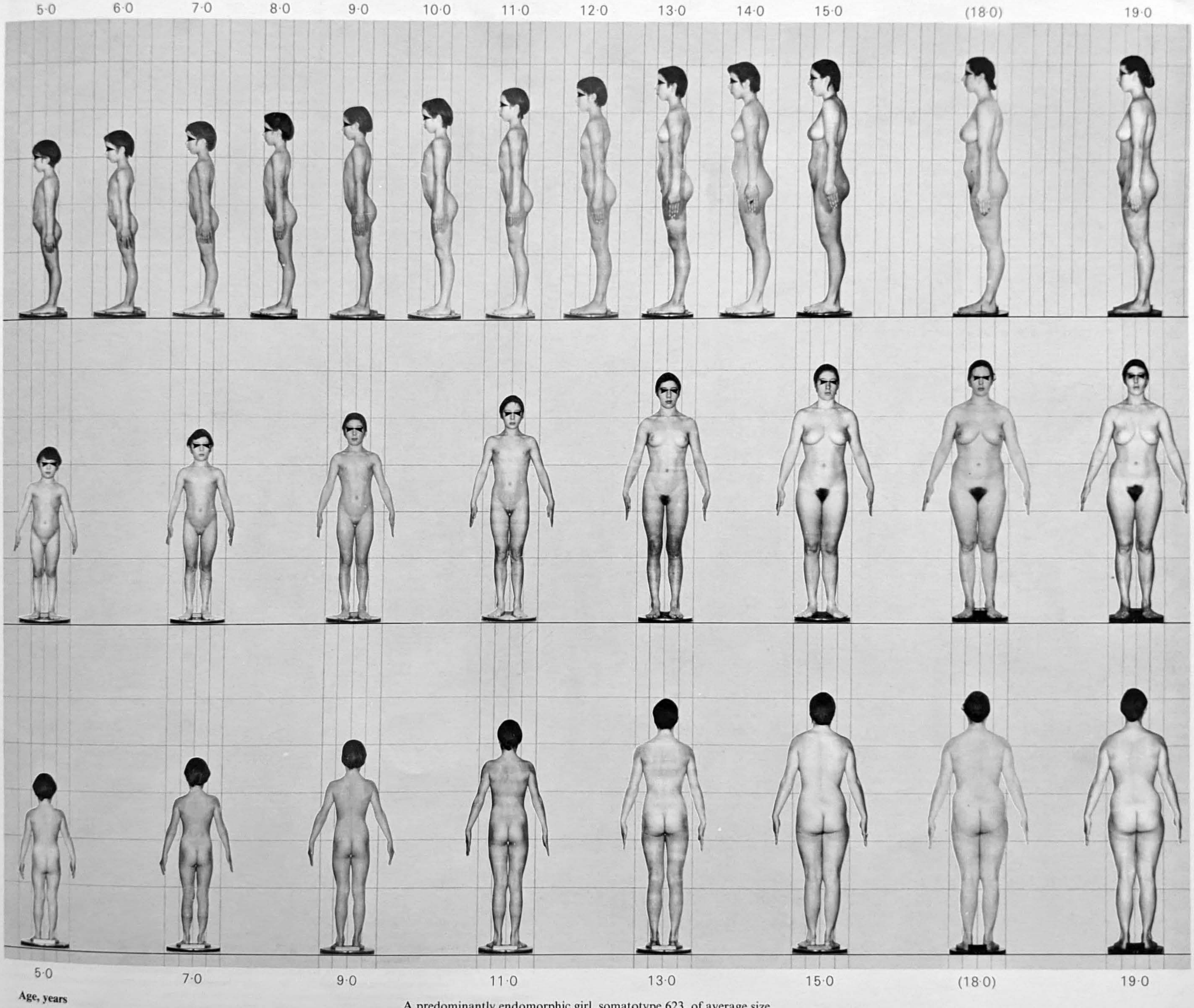
Another highly endomorphic girl, somatotype 623. She is of average size, with height at the 50th centile throughout and height velocity correspondingly near the 50th. Peak height velocity reaches the 35th and occurs at the average age. Menarche is at 12·8 years. Sitting height and leg length are at first in average proportion, but sitting height becomes relatively greater post-puberty, the difference between the SD scores reaching −1·2. There is practically no spurt in leg length.

Biacromial diameter approximates the 25th centile throughout and biiliac the 50th; the consistency of both these curves (apart from one measurement of biacromial about 0·5 mm too low) is striking.

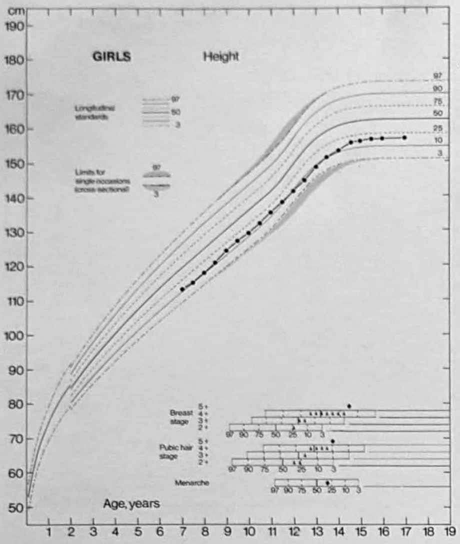
Weight is at the 50th till age 13 after which it rises to the 75th. Triceps skinfold correspondingly rises after menarche from the 25th to the 50th.

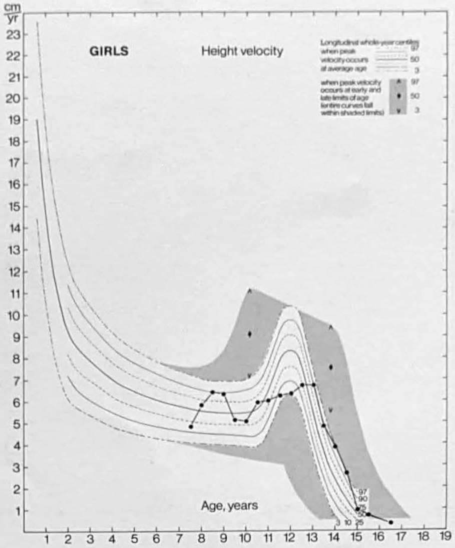
Bone maturity is initially at the 90th centile but falls to between the 50th and the 75th centile till 12·5 years, when the record ceases. Breast development proceeds faster than usual, with stage 2 taking place later than average but stages 3 and 4 earlier. Pubic hair development occurs at exactly the average times.

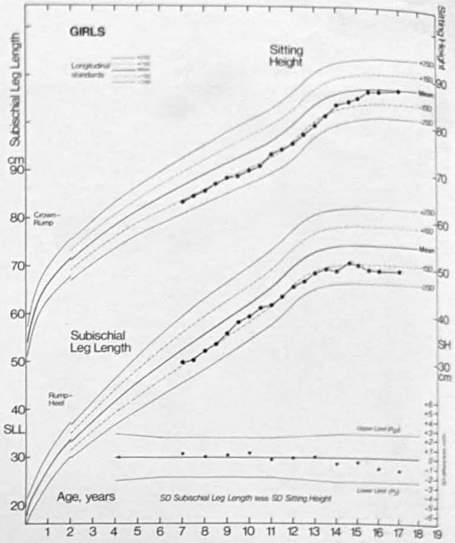
The pictures show some hyperextension of the knees, which persists. The increase of fat from 13 to 18 is striking, but at 19 some has been lost.

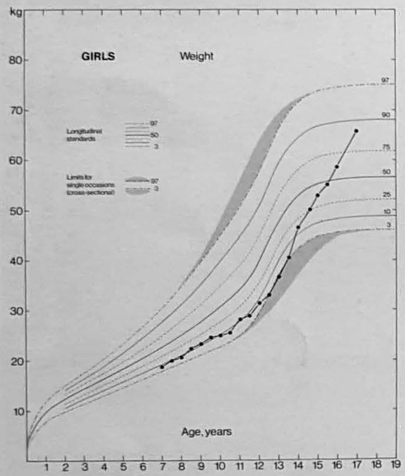


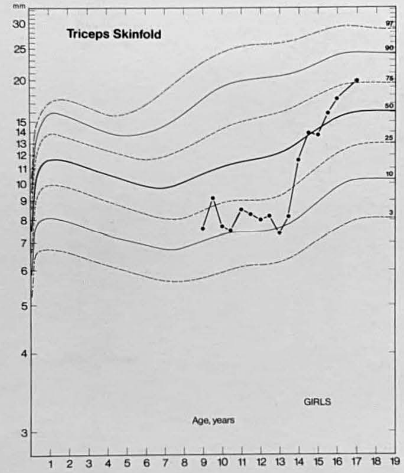
A predominantly endomorphic girl, somatotype 623, of average size.

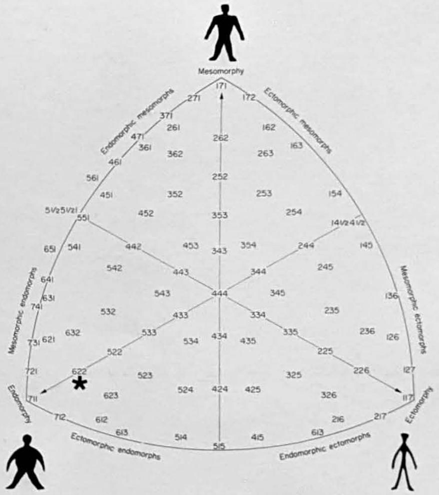


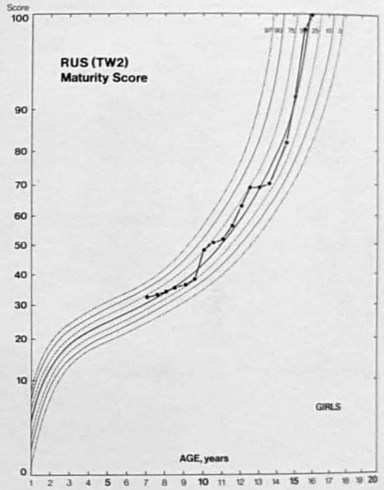


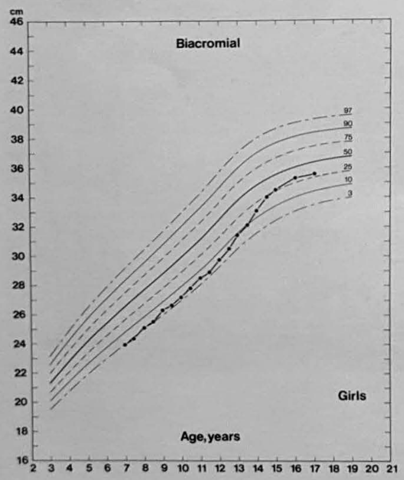


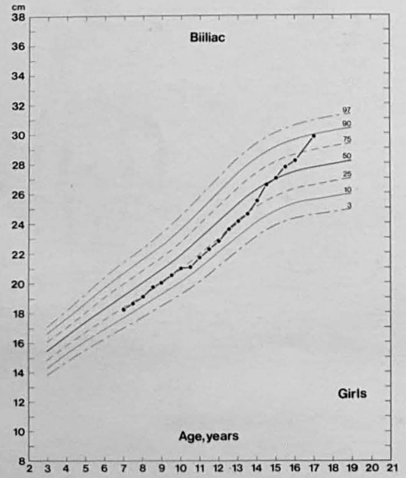












Normal Girl *Subject No. 46*

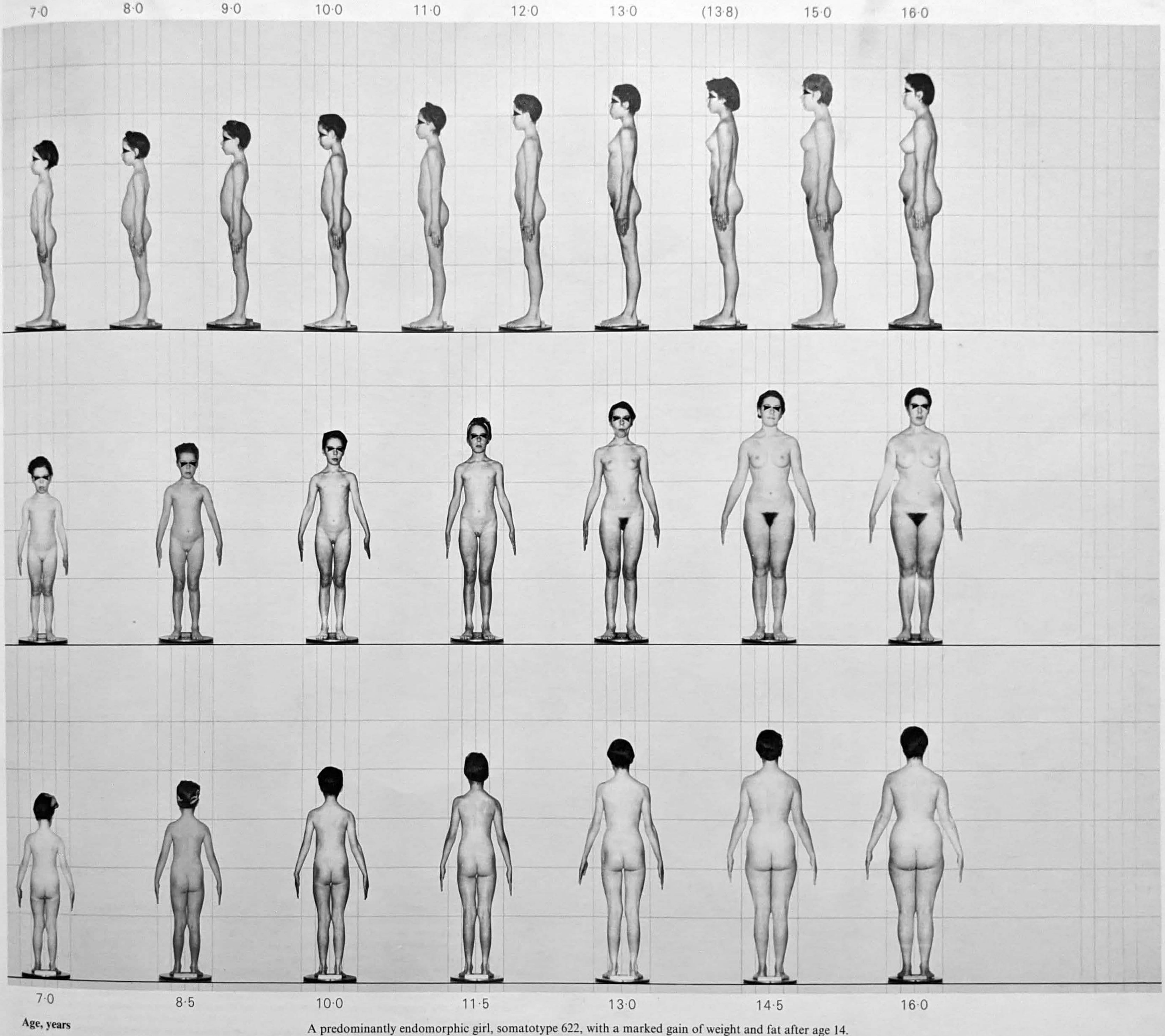
A girl of somatotype 622, who becomes obese following puberty. Height is consistently at the 10th centile until puberty. Weight is at the 10th, falls to the 3rd because of a rather late spurt, but then climbs to the 90th, accompanied by triceps skinfold (and also the other skinfolds, not shown here). At 17 she is about 15 kg overweight for her "frame" size.

Height velocity shows a spurt reaching about the 25th centile, but rather prolonged, with a very indefinite beginning. Sitting height has a prolonged spurt but leg length none at all. In consequence, although both are initially at −1 SD, sitting height ends by being relatively larger, at 0·0 SD, compared with leg length at −1·2 SD.

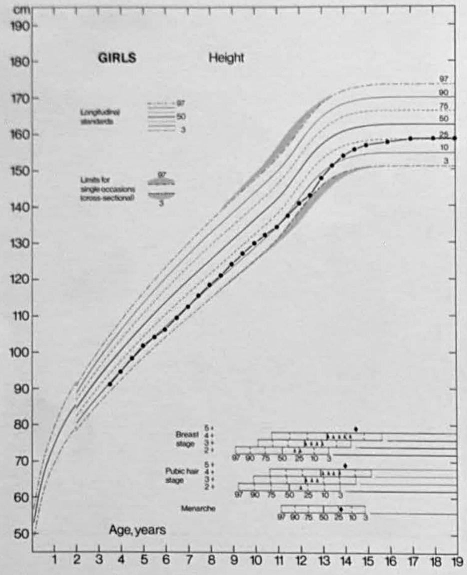
Biacromial diameter rises from the 3rd centile to the 25th, giving quite a definite change of shape to the chest. Biiliac diameter remains at the 25th centile till the increase in fat begins, when it rises to the 90th.

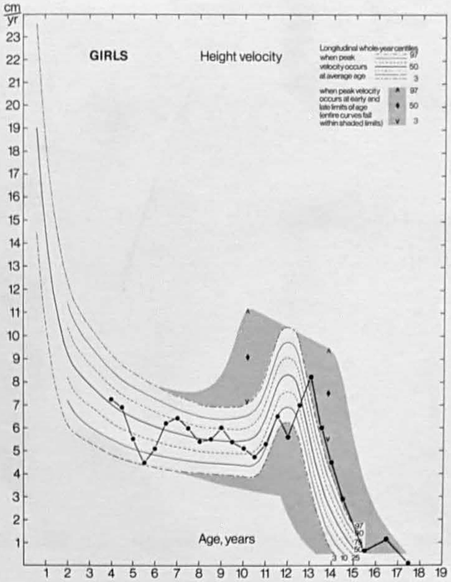
Bone maturity is throughout around the 50th, and menarche is at 13·5 years. Breast and pubic hair development agree closely with this timing.

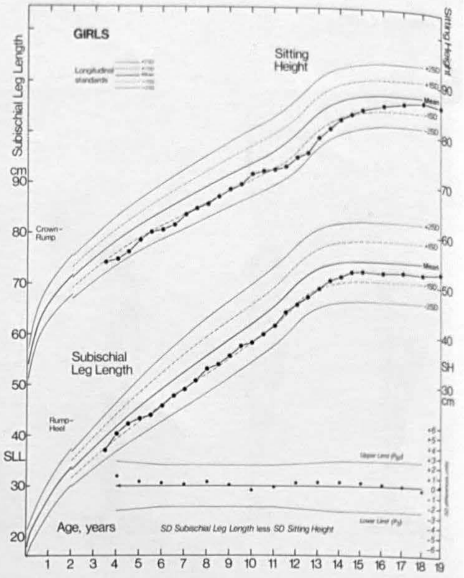
The pictures show a girl who at 12 appears quite slender (when her weight and height were at the same centiles). By 16 she is well along the road to obesity of "clinical" proportions.

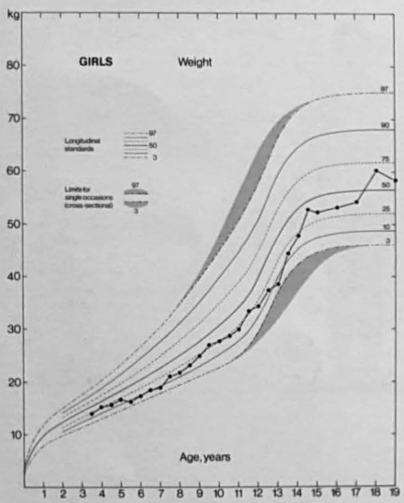


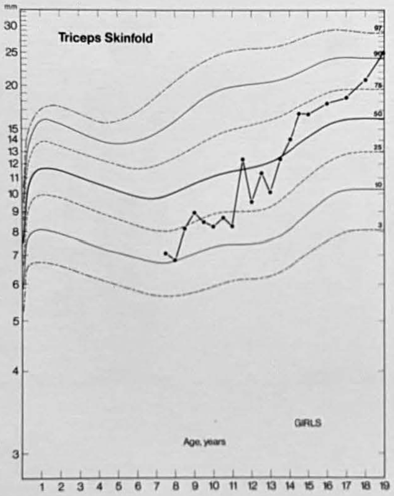
A predominantly endomorphic girl, somatotype 622, with a marked gain of weight and fat after age 14.

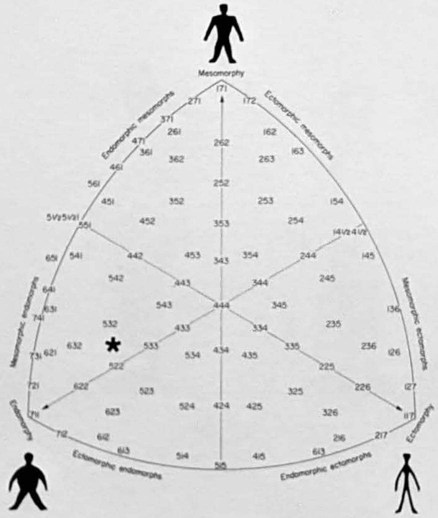


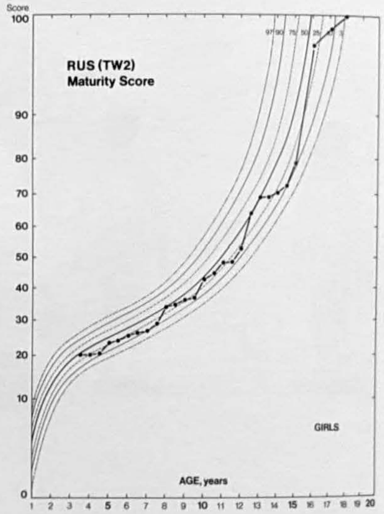


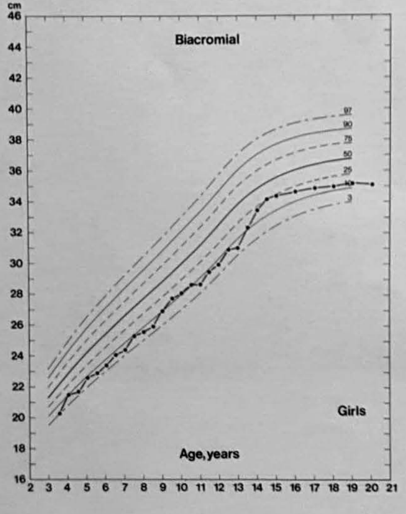


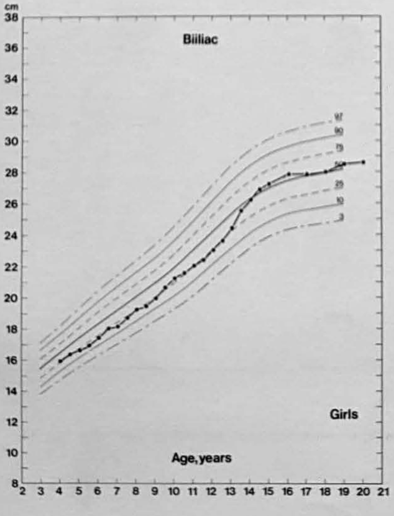












Normal Girl — *Subject No. 47*

A predominantly endomorphic girl, somatotype 52½2, with a slightly greater than average adolescent growth spurt. Height is initially at the 10th centile, drops to the 3rd due to a relatively late spurt and then rises to the 25th. The height velocity shows a curious slowing down at ages 4·5 to 6 followed by a return to about the 50th centile, the changes being entirely due to leg length as in subect 43 above. We can find no obvious medical or social reason for the slowing which is also quite visible in the weight curve. The height spurt starts at about 10·5 and reaches its 65th centile peak at 14.

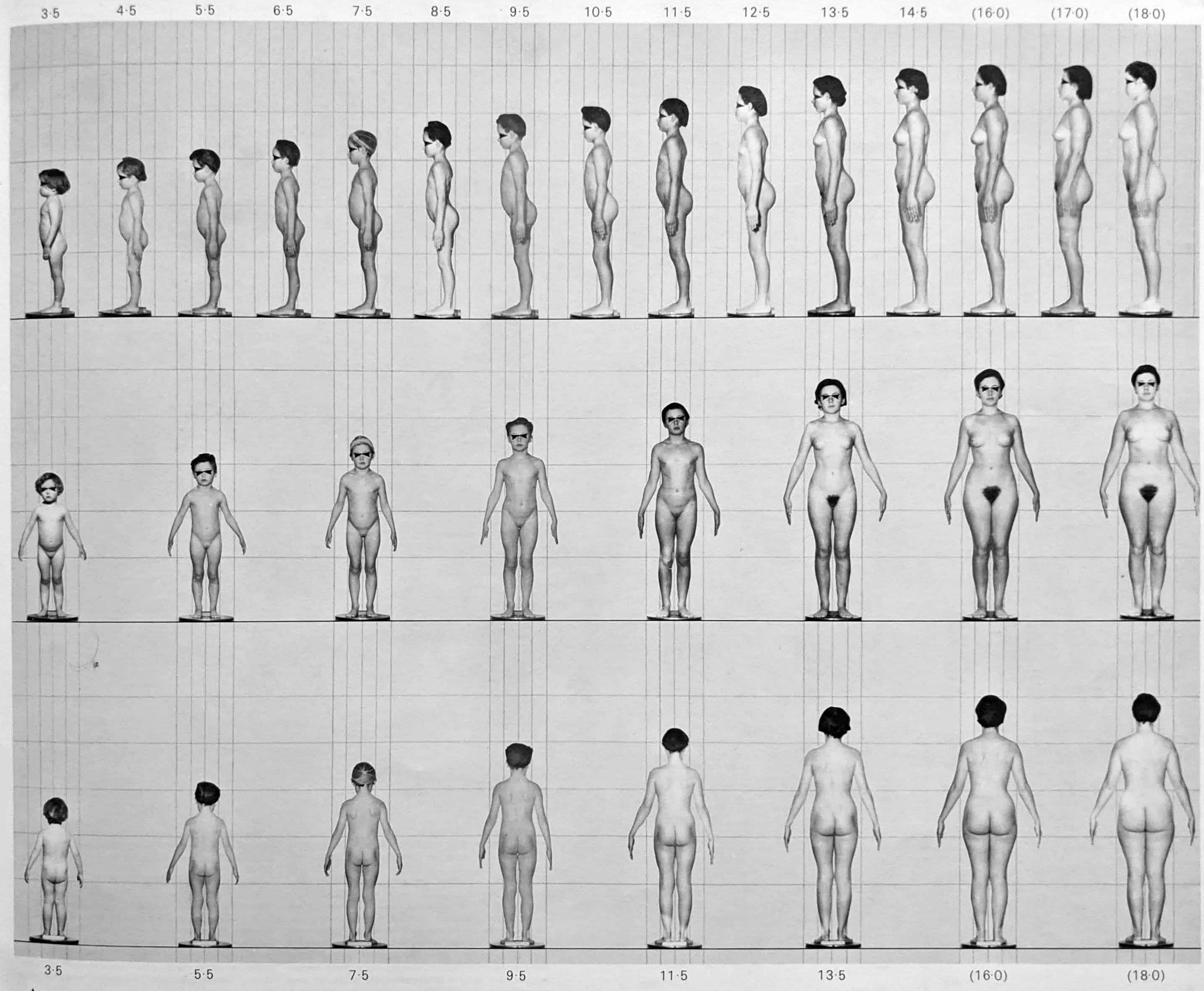
Sitting height and leg length remain in average proportion throughout and both end at about the 25th centile. Biacromial diameter lies consistently around the 10th and biiliac diameter rises from the 25th to the 50th at puberty.

Weight fluctuates between the 10th and 25th centiles till age 15, when it rises to about the 60th. Triceps skinfold steadily rises from the 10th centile to the 90th. Thus this girl becomes overweight after puberty like the preceding subject, though not to as great a degree. She needs to lose only about 7 kg from her 18 year-old weight (last picture).

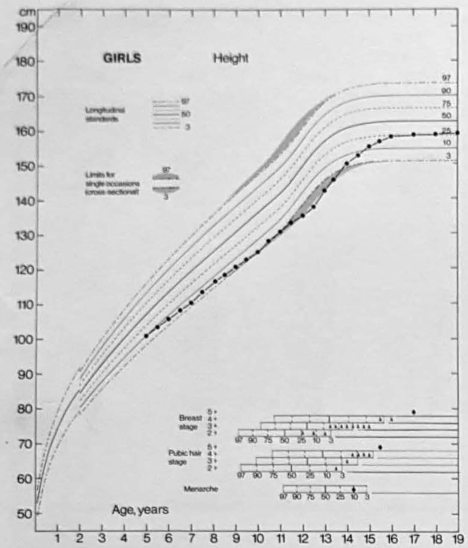
Bone maturity is consistently between the 10th and 30th centiles until final epiphyseal fusion, which takes longer than average. Menarche is at 13·8 and breast and pubic hair develop slightly earlier than this might imply.

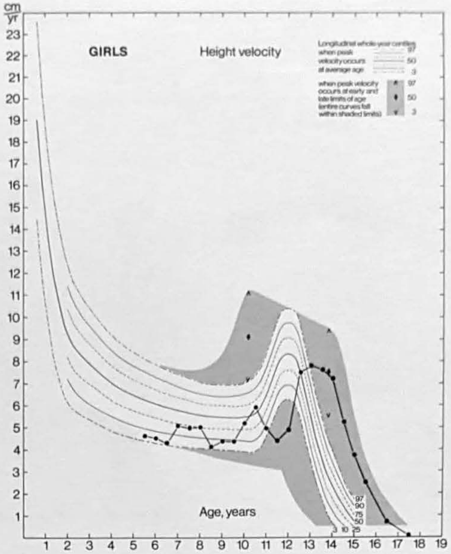
The pictures show an endomorphic girl, who nevertheless looks quite athletic around 11 to 13.

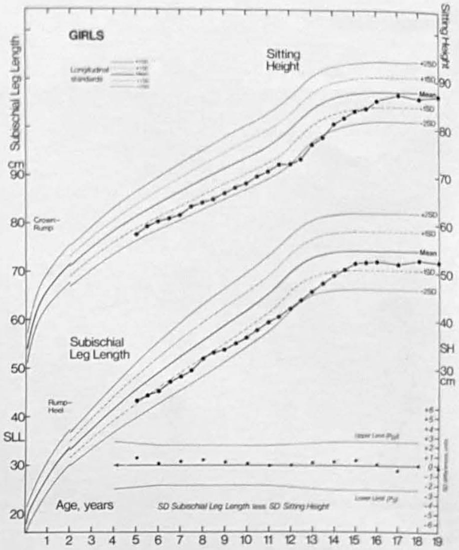
Normal Girl *Subject No. 47*

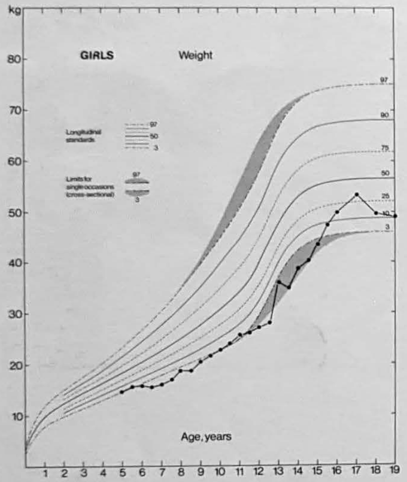


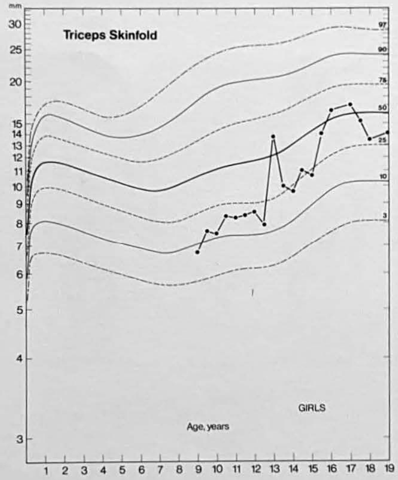
A predominantly endomorphic girl, somatotype 52½2.

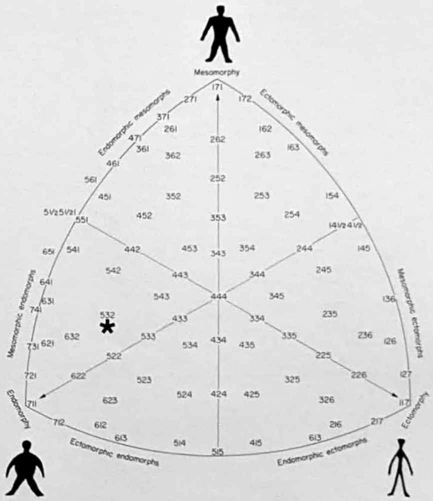


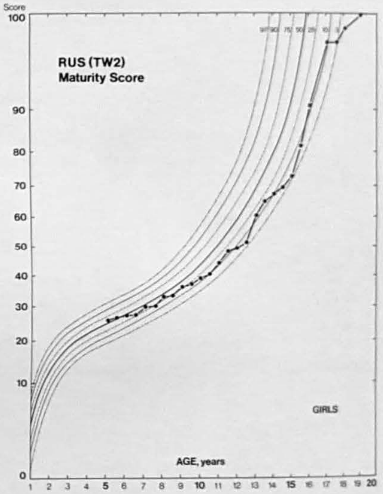


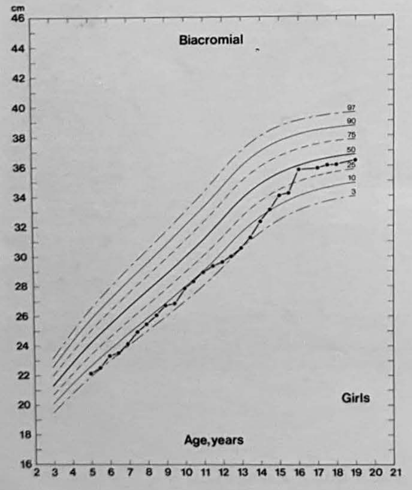


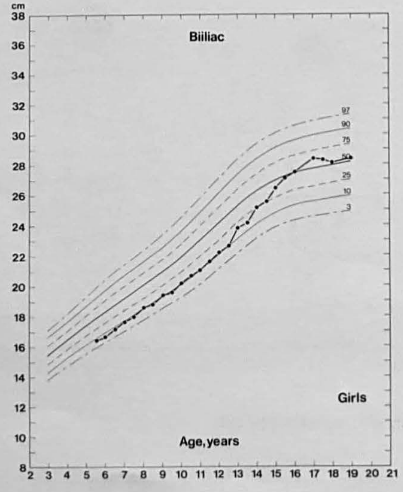












Normal Girl

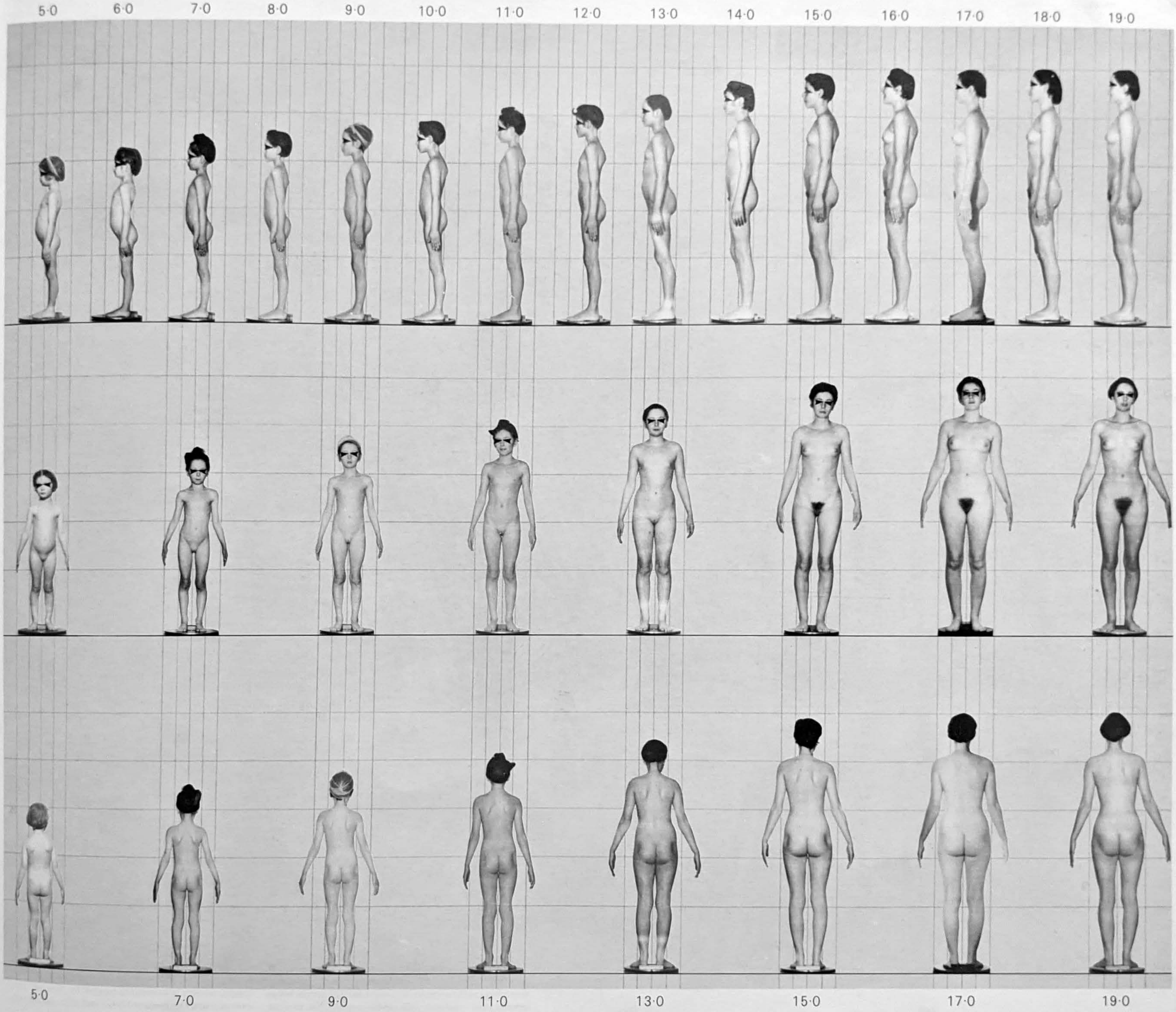
Subject No. 48

A predominantly endomorphic girl, but with quite high secondary mesomorphy, somatotype 532. Height is initially at the 10th centile, drops to below the 3rd due to a late spurt, and then rises to end at the 25th. Height velocity is between the 3rd and 25th till 9·5 years when a small spurt occurs with a peak at 10·5 and a subsequent trough before the adolescent spurt proper. We have seen truly biphasic adolescent height spurts in girls at boarding schools subject to environmental stress at a particular moment in adolescence, but in these cases secondary sex character development also starts, stops and starts again. In this subject the "spurt" at 10·5 occurs long before the breast or pubic hair develop, so it probably does not represent this biphasic phenomenon. The adolescent spurt proper starts at about age 12 and reaches a 50th centile peak at age 13. The peak is prolonged and this causes the rise of height from the 10th to the 25th centile. Sitting height and leg length are in average proportion.

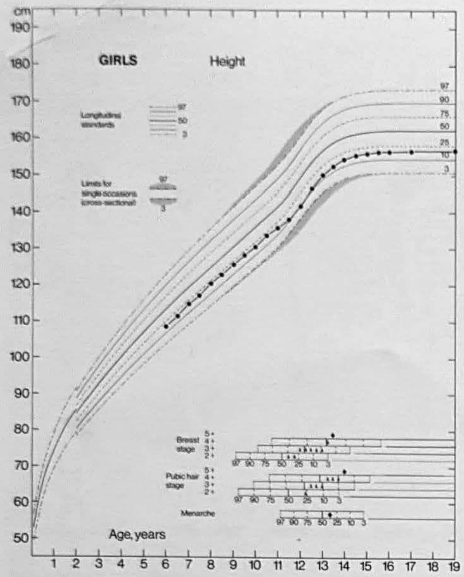
Biacromial diameter rises steadily from the 3rd centile to the 30th and biiliac rises from the 10th to the 50th. Thus an originally rather narrow linear physique changes to a broader, sturdier one.

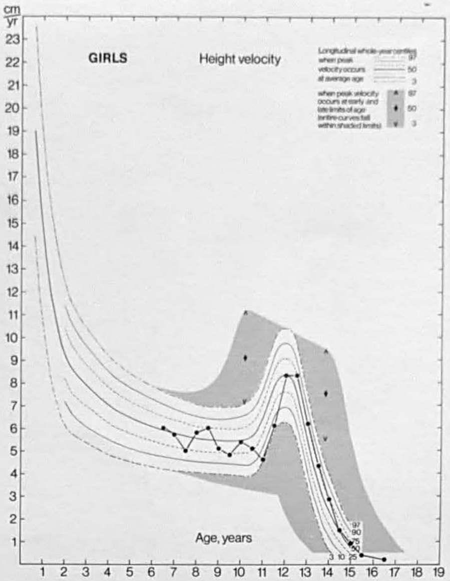
Weight is initially at the 3rd centile and ends at the 10th; triceps skinfold begins at the 10th and ends at the 25th. The sharp rise in triceps and lesser rise in weight at age 13 followed a brief period in which neomercazol was administered for supposed hyperthyroidism, a diagnosis which was not sustained. Bone maturity drops gradually from the 50th to the 3rd centile, and then stays at about the 10th centile, in agreement with menarche at 14·3 years, the late peak height velocity, and the equally late development of breasts and pubic hair.

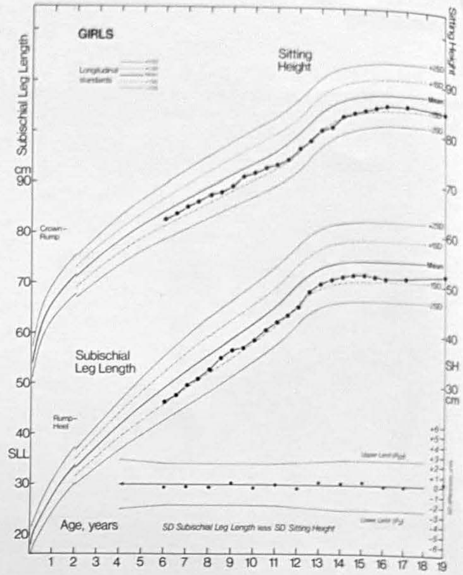
The pictures show a girl who, though endomorphic, looks much more athletic than the previous subjects with high ratings in endomorphy.

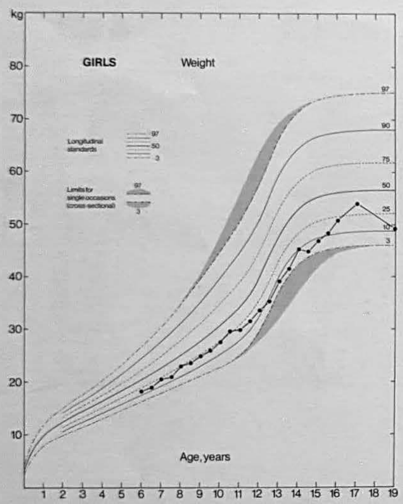


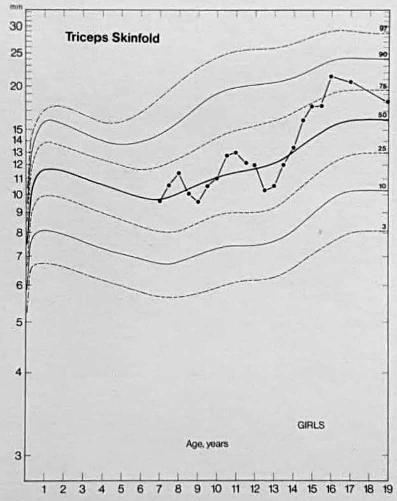
A predominantly endomorphic girl, somatotype 532, with a late spurt.

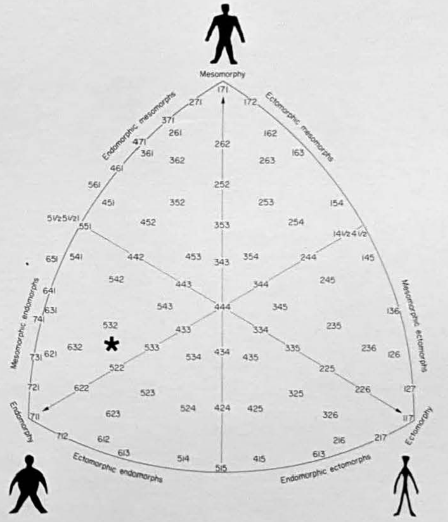


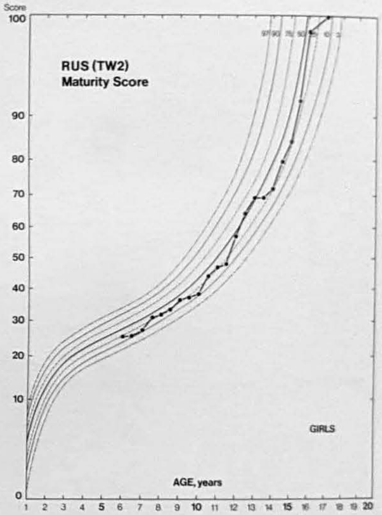


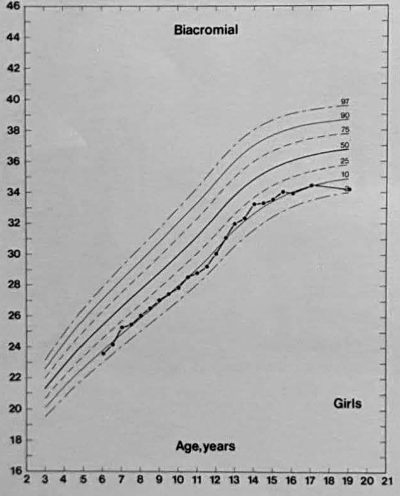


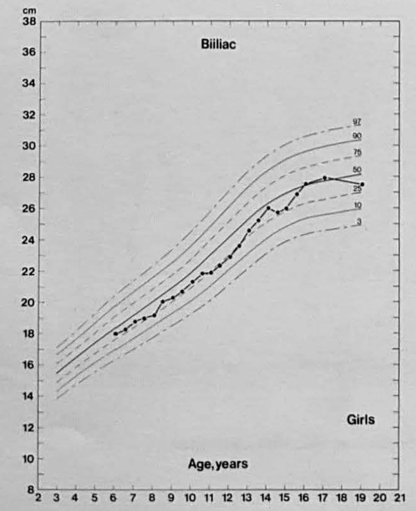












Normal Girl *Subject No. 49*

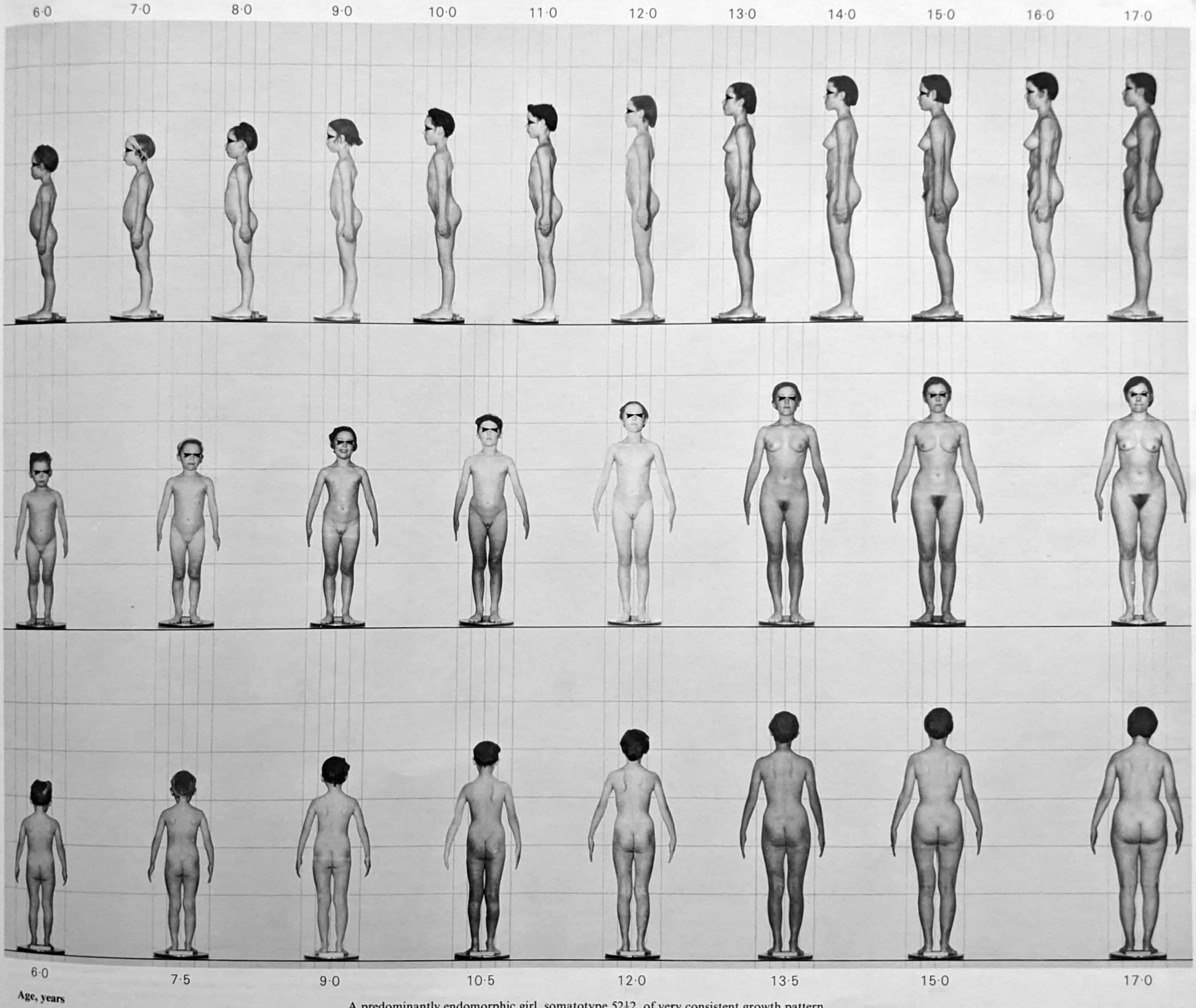
A small, predominantly endomorphic girl, with very consistent growth patterns. Height remains at about the 15th centile throughout; height velocity is around the 40th centile before puberty, and reaches a 50th centile peak at just after the average time. Sitting height and leg length both remain at about −1 SD throughout growth.

Biacromial diameter is at the 10th centile (except for the last point) and biiliac diameter is between the 25th and 50th.

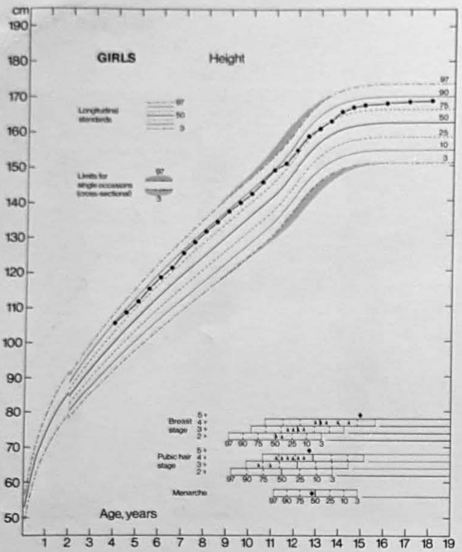
Weight is between the 10th and 25th and triceps skinfold is around the 50th except briefly at 16 and 17.

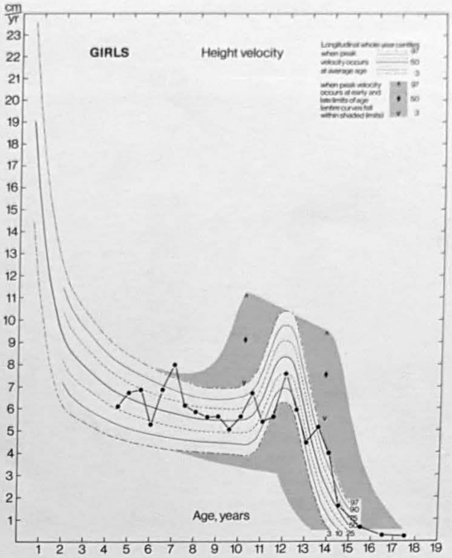
Bone maturity is consistently between the 10th and 50th; menarche is at 13·4 years, and breast and pubic hair development are in agreement with this.

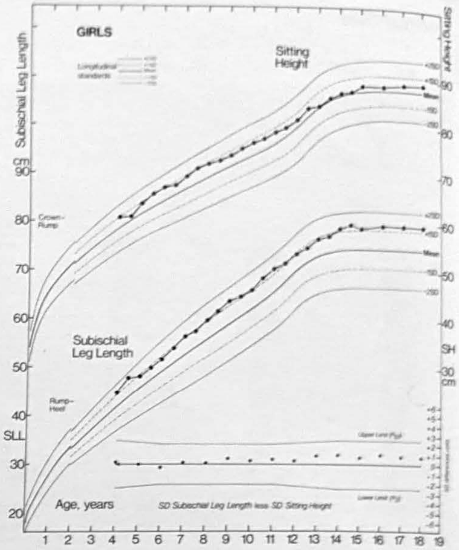
The pictures show a small, well-built girl whose hyperextended knees and lordosis in the pre-school years both gradually disappear.

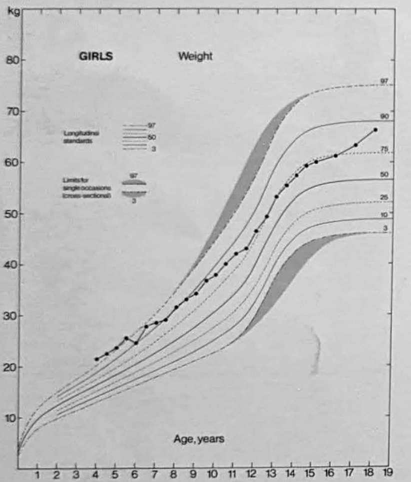


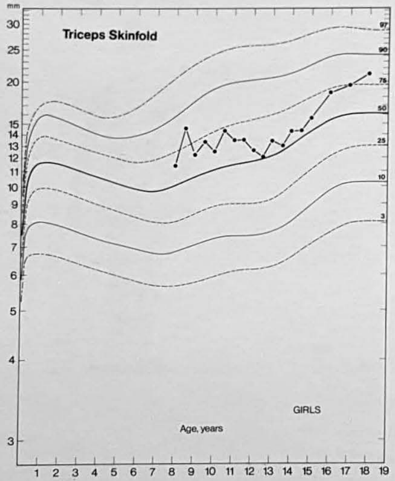
A predominantly endomorphic girl, somatotype 52½2, of very consistent growth pattern.

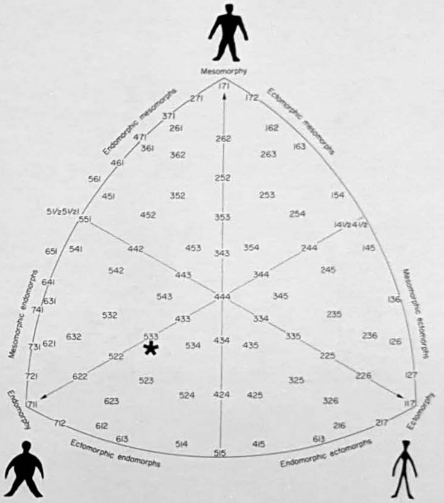


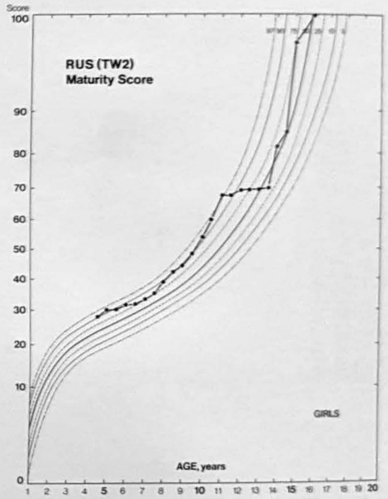


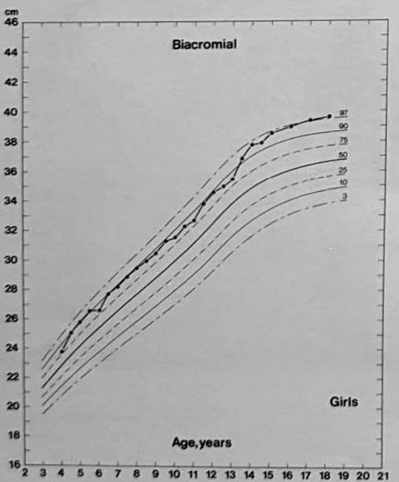


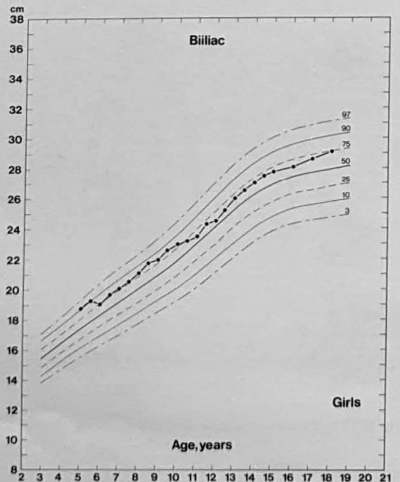












Normal Girl

Subject No. 50

A girl of somatotype 533, thus approaching the average physique for women, though much above average in size. Height is consistently about the 80th centile. Height velocity is less regular than in most subjects and the spurt is not very marked, with a peak reaching the 25th centile at exactly the average age. The dip at age 6·0 and the rise at 7·0 may both be explained by the low height measurement at 6·5. The "error" would have to be of the order of 1·0 cm. Since an "error" of this order is also apparent in sitting height, both probably represent problems of positioning the subject, rather than errors of reading the instruments or of recording. This girl was in fact never easy to position. The apparently dramatic slow-down and catch-up in the velocity due simply to a 1 cm error points the moral of the importance of really accurate measurement.

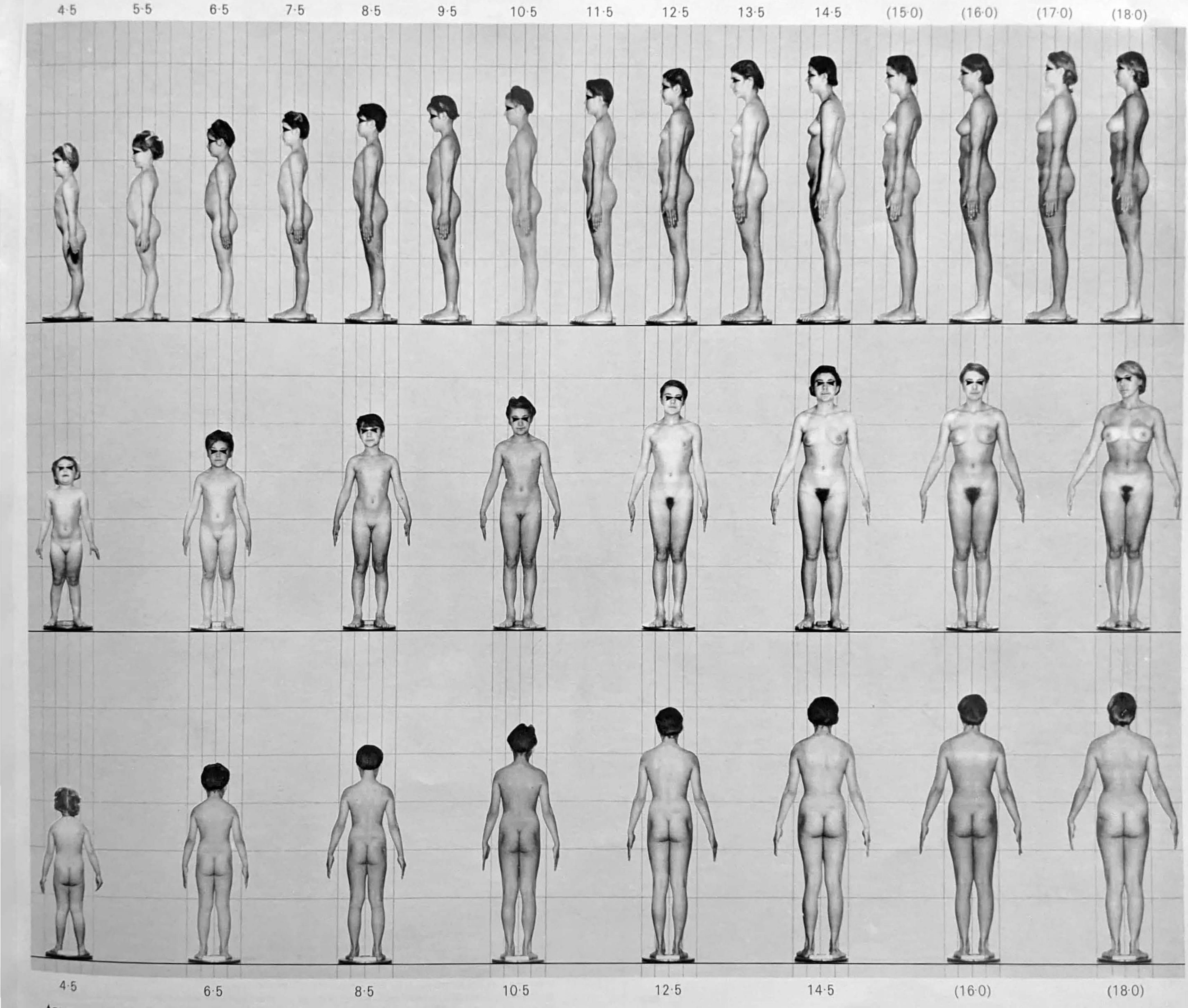
Sitting height and leg length, initially at similar centiles, diverge at puberty, sitting height having a small spurt and ending at a lower centile than leg length.

Biacromial diameter, initially at the 75th centile, ends at the 97th but biiliac diameter remains constantly around the 75th. Thus this subject, with broad shoulders and longish legs, could be said to develop a somewhat masculine-type physique at puberty.

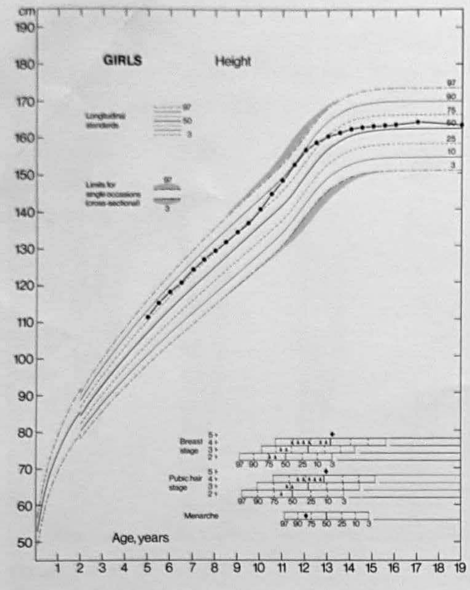
Weight, initially at the 97th, falls to the 75th where it stays except at age 18. Triceps skinfold is throughout a little above average.

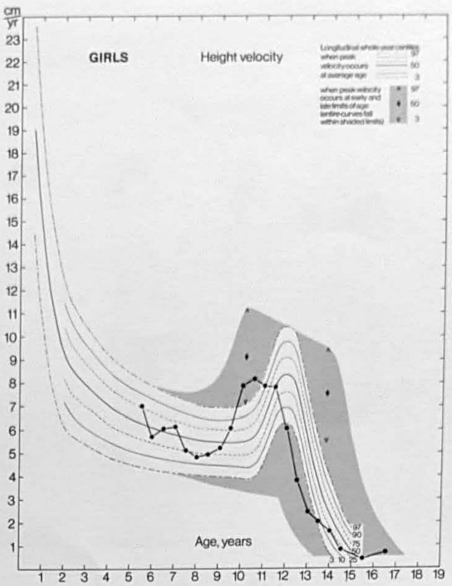
Skeletal maturity shows a rather unusual curve; at first relatively advanced, it has a complete arrest from 11 to 13·5 which reduces the centile from 97th to 50th, where it subsequently remains. Menarche is at 12·9 years (50th centile) and breast development is in agreement with this. However, the pubic hair stages are reached much earlier. This subject is one of the girls (like subject no. 37 and subject no. 52) in whom the first sign of puberty is development of pubic hair rather than of breasts. Peak height velocity is at the 50th for timing. Thus it would seem that whatever was controlling maturation in some way held up further progress of bone age until height and secondary sex character progression had caught up.

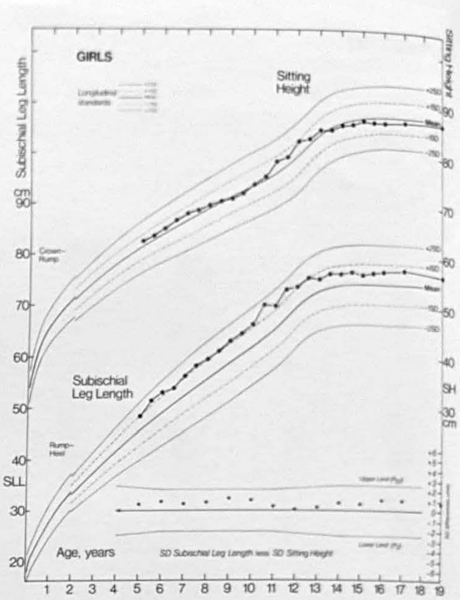
The pictures show a chubby girl of pre-school age growing into a powerfully built young adult.

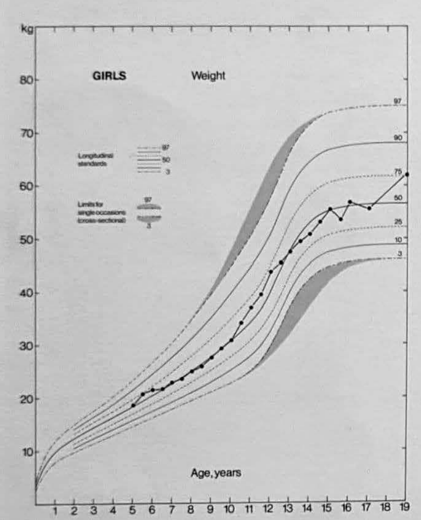


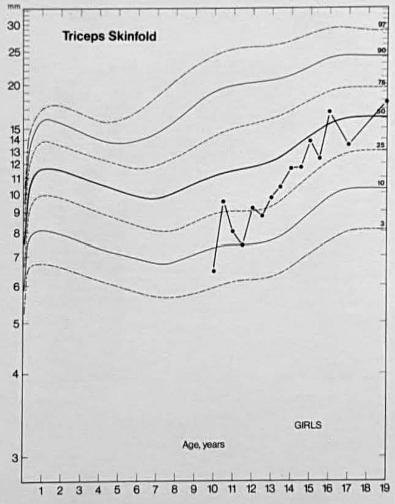
A tall girl of somatotype 533.

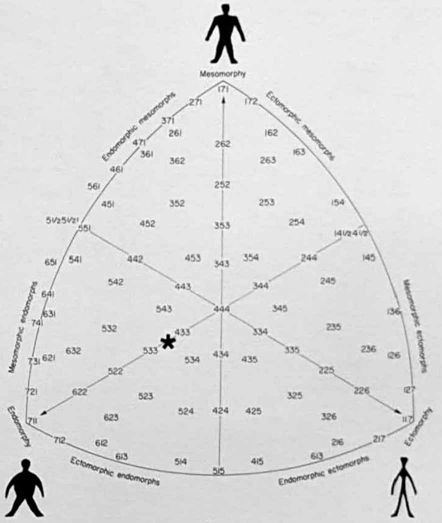


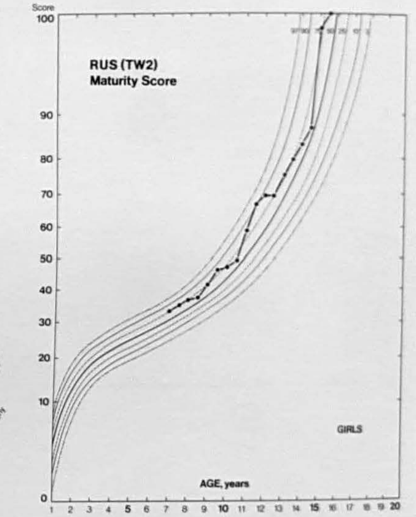


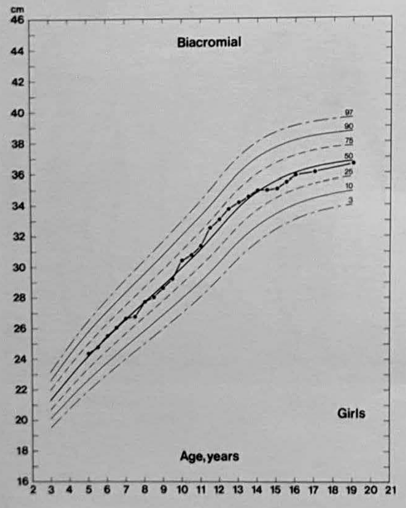


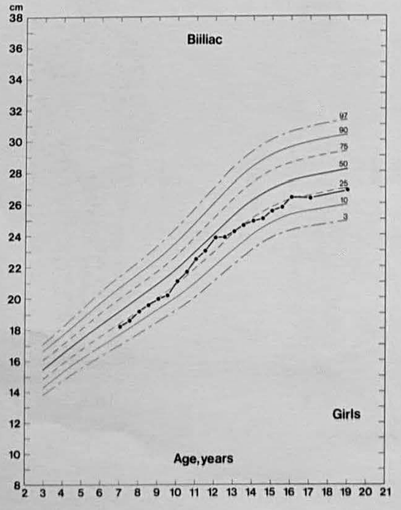












Normal Girl *Subject No. 51*

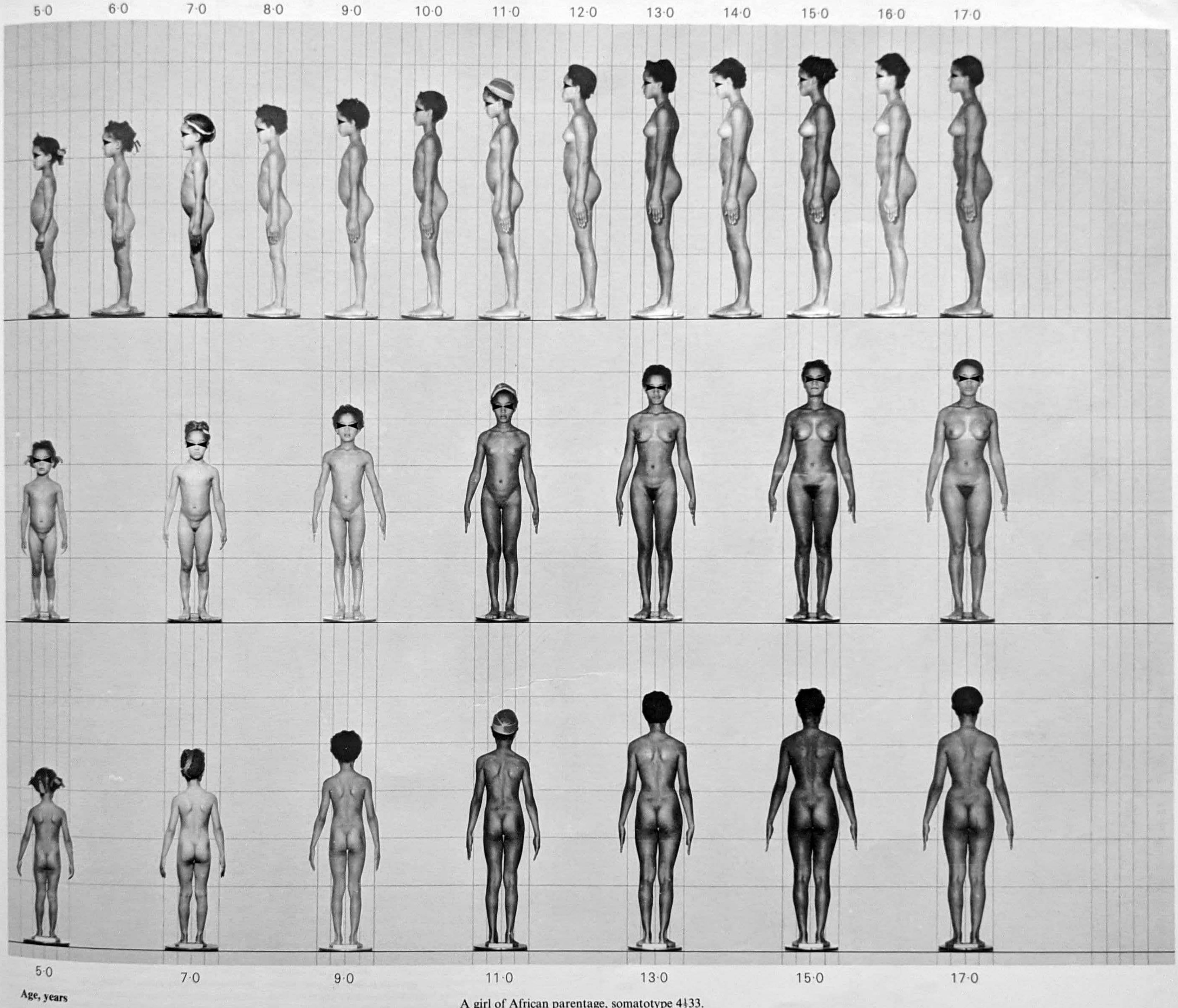
An early-maturing girl of African parentage, somatotype 4½33. She is the first of three girls of "central" somatotype with whom we close this section.

Height is at about the 75th centile at age 5, rises temporarily to the 90th at 11 and 12 and ends at the 60th. Height velocity has its peak at about age 10·5, well ahead of average. The legs are relatively long, with SD scores of initially +1 and at maturity +0·5. Sitting height SD score initially is about +0·2 and at maturity −0·2.

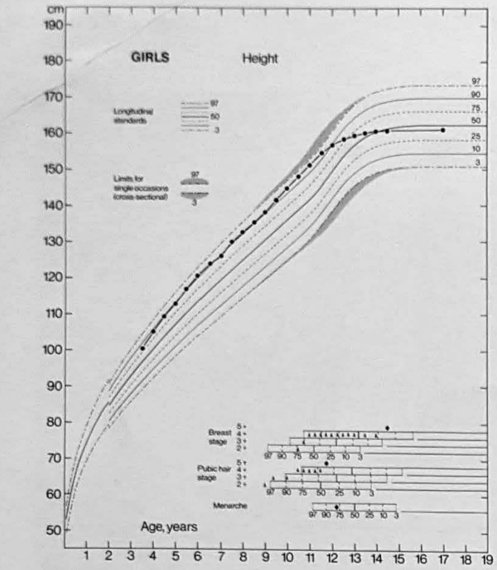
Biacromial diameter is at the 50th centile throughout and biiliac diameter at the 25th. Weight is at about the 50th until well after puberty, but shoots up between 17 and 19. Triceps skinfold is initially low, gradually rises to about the 35th centile during puberty and then between 17 and 19 also shoots up, to the 65th centile.

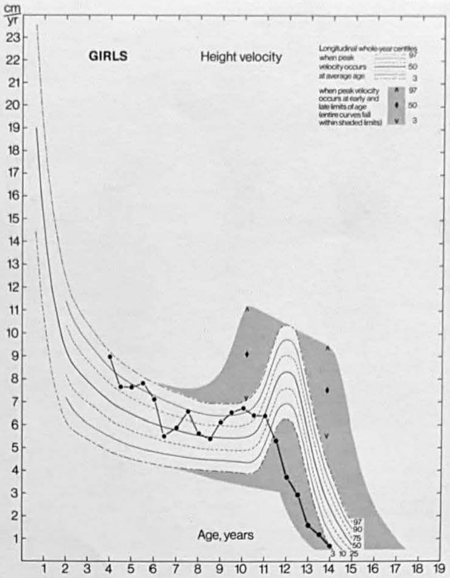
Skeletal maturity is about the 75th centile throughout and menarche is at 12·1 years with breast and pubic hair development about equally early.

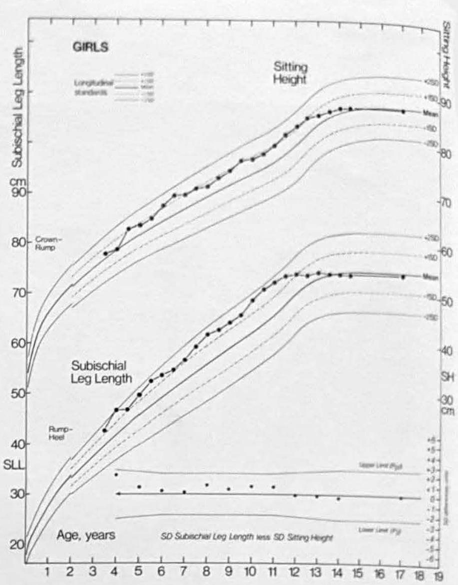
The pictures show a well built physique. The initial lordosis soon disappears.

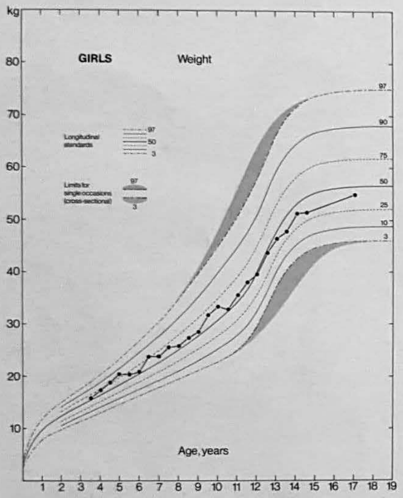


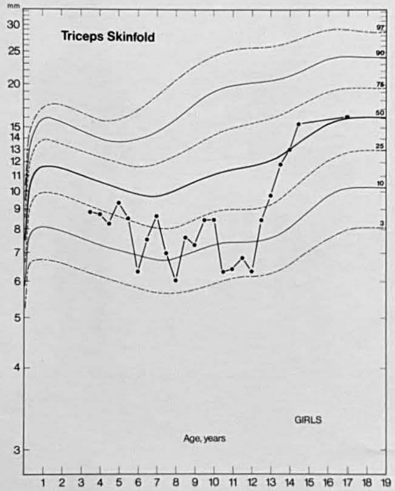
A girl of African parentage, somatotype 4½33.

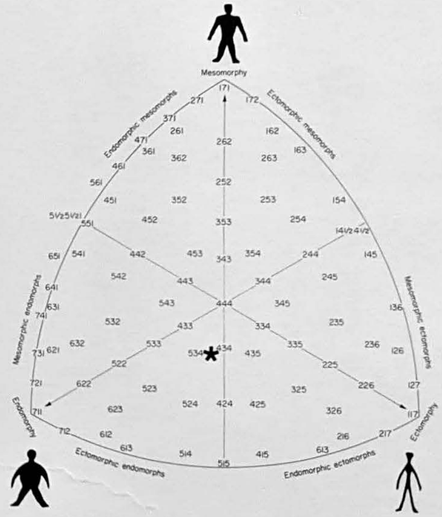


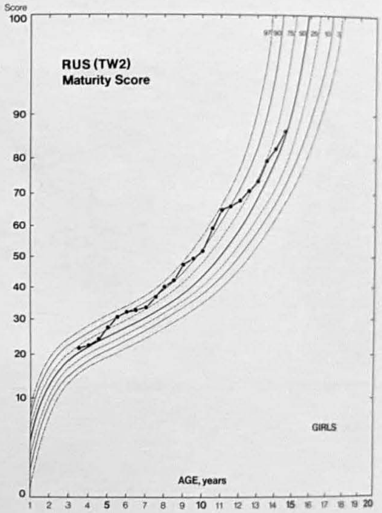


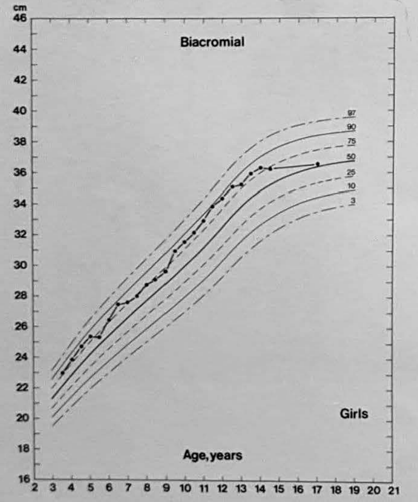


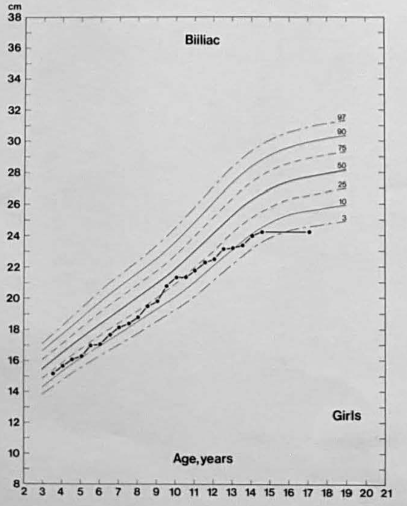












Normal Girl

Subject No. 52

A second girl of "central" somatotype 4½34. Height is at the 90th centile from age 4 till 9, nearly reaches the 97th during an early adolescent spurt and then, because the spurt is much smaller than usual, ends at the 40th centile. This is the largest reduction from pre-pubertal to post-pubertal height centile in our sample. The height velocity decreases from the 75th centile to the 50th and then rises at age 9 into the spurt. The peak of the spurt however, is below the 3rd centile, this being the smallest in all our series. It occurs 2 years later than average; in contrast menarche, at age 12·2, is less than a year earlier than average. Sitting height and leg length curves throw little light on this unusual situation. The legs are relatively slightly longer before puberty; both body segments have the early, small spurt and both end at just below the 50th.

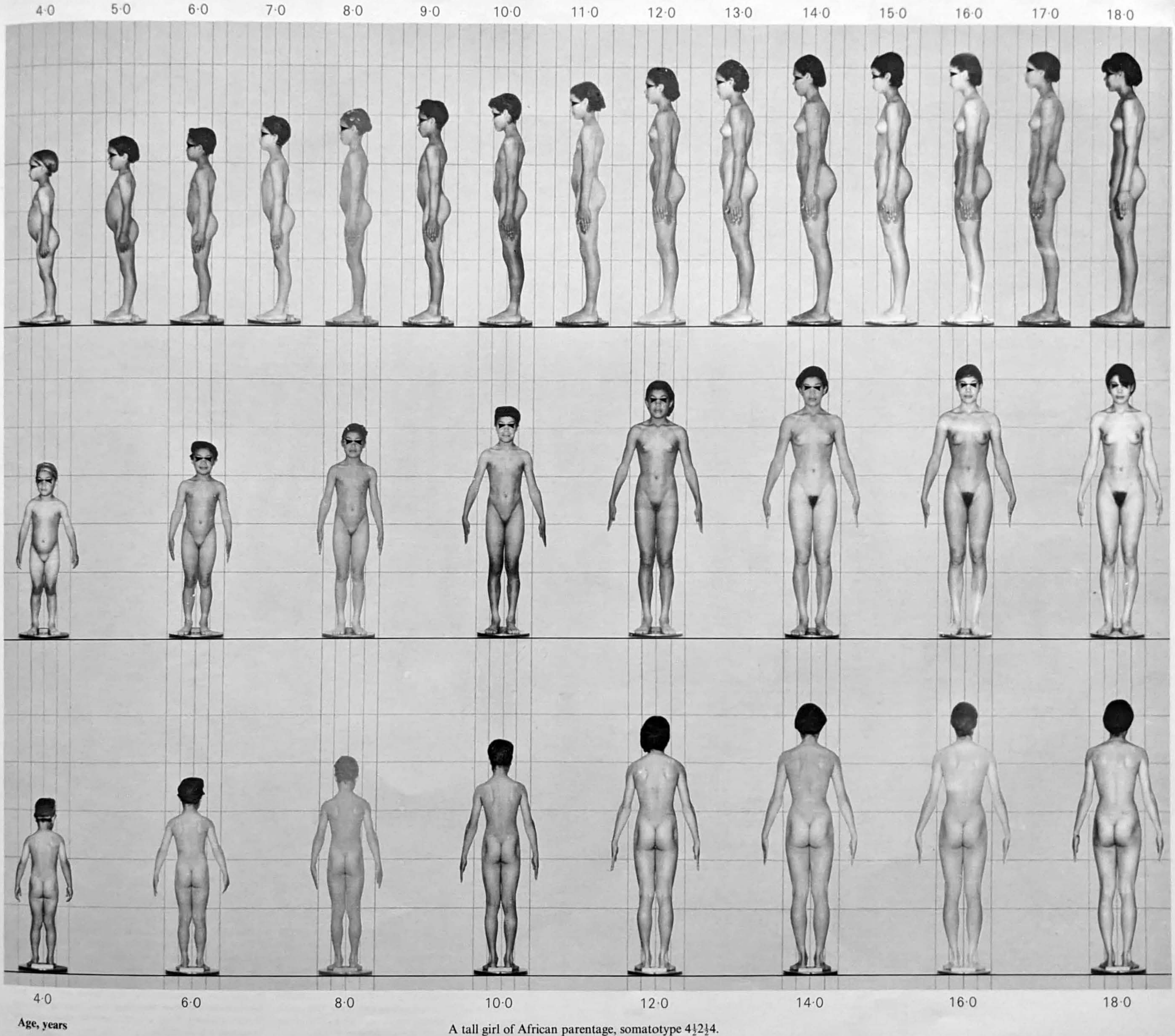
Biacromial diameter is at the 75th centile before adolescence, when the small spurt reduces it to the 50th. Biiliac diameter is likewise reduced, from the 25th centile to the 3rd.

Weight is between the 50th and 75th centiles until late in puberty when it falls to about the 40th. Triceps skinfold is between the 5th and 30th till age 13 when it rises rather rapidly to the 50th.

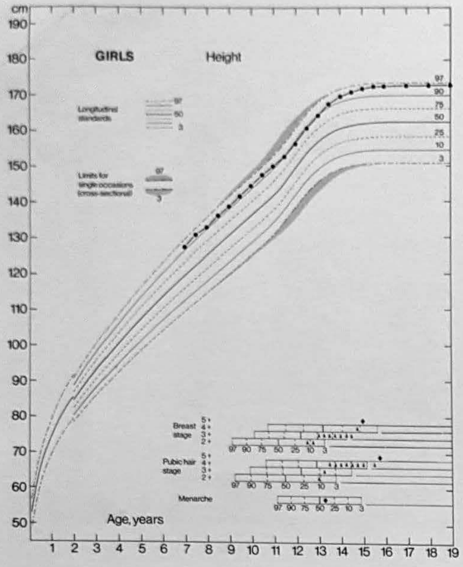
Skeletal maturity is at the 90th centile from 5 till 12; from 12 to 14·5 it falls gradually to the 50th. Breast development agrees with menarche in the timing of stages 2 and 3; stage 4 persists for a long time. Pubic hair is considerably more advanced and corresponds in timing to peak height velocity.

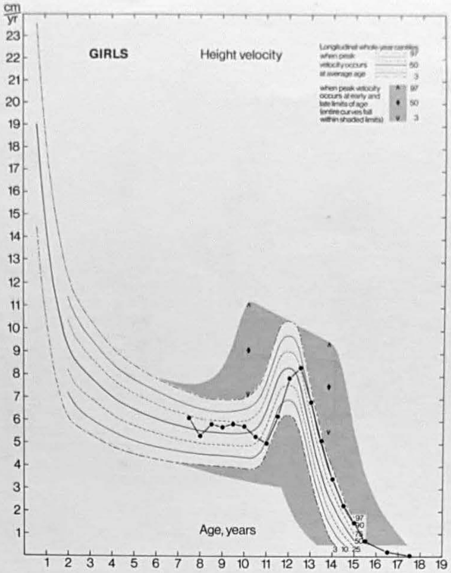
The pictures show an athletic-looking physique, easily visible as such by age 5·5 years.

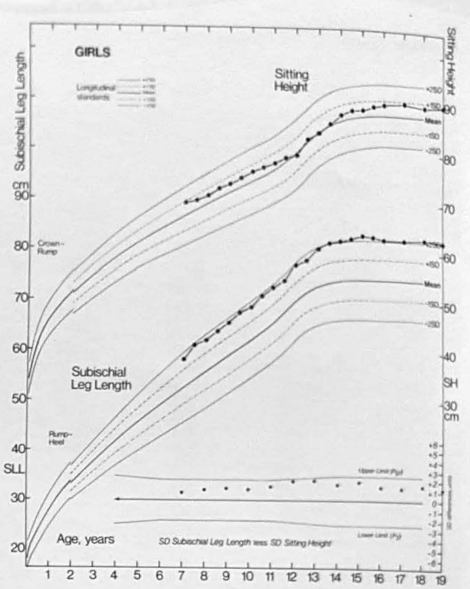
Subject No. 53

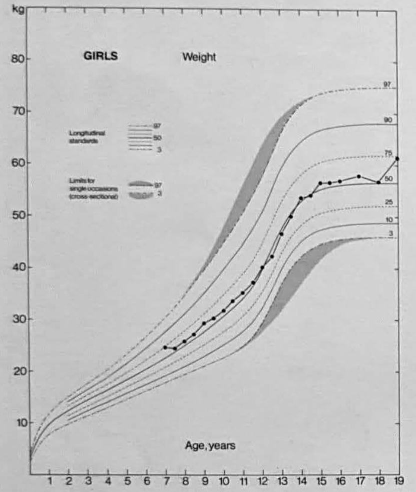


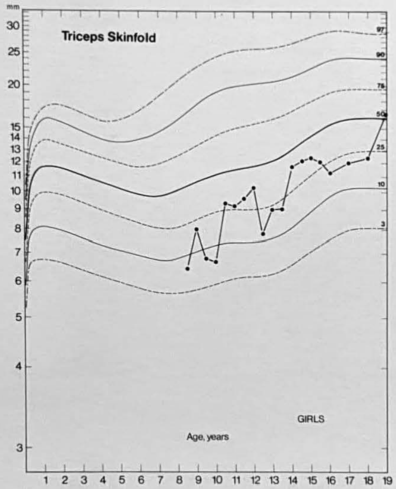
A tall girl of African parentage, somatotype 4½2½4.

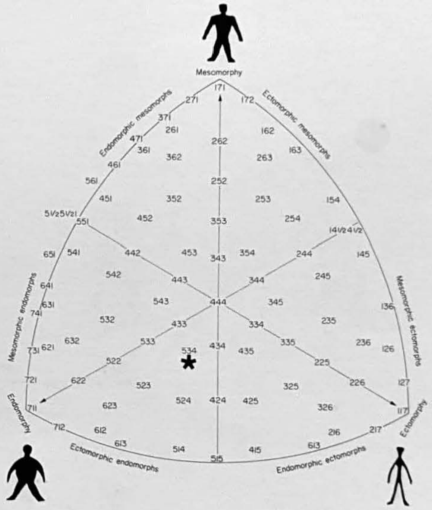


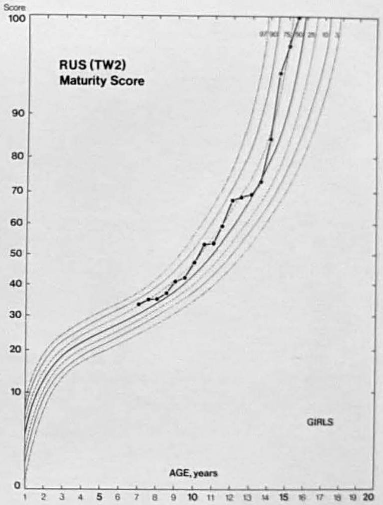


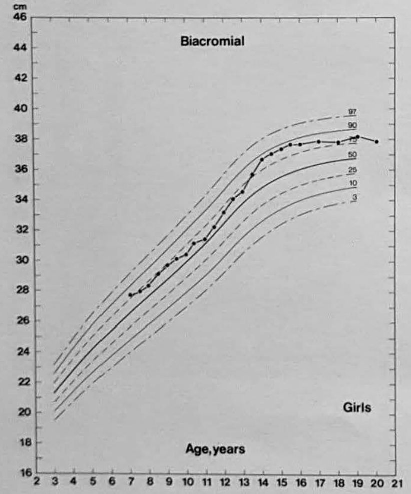


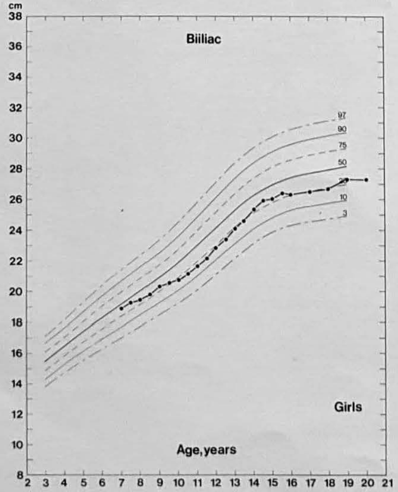












Normal Girl

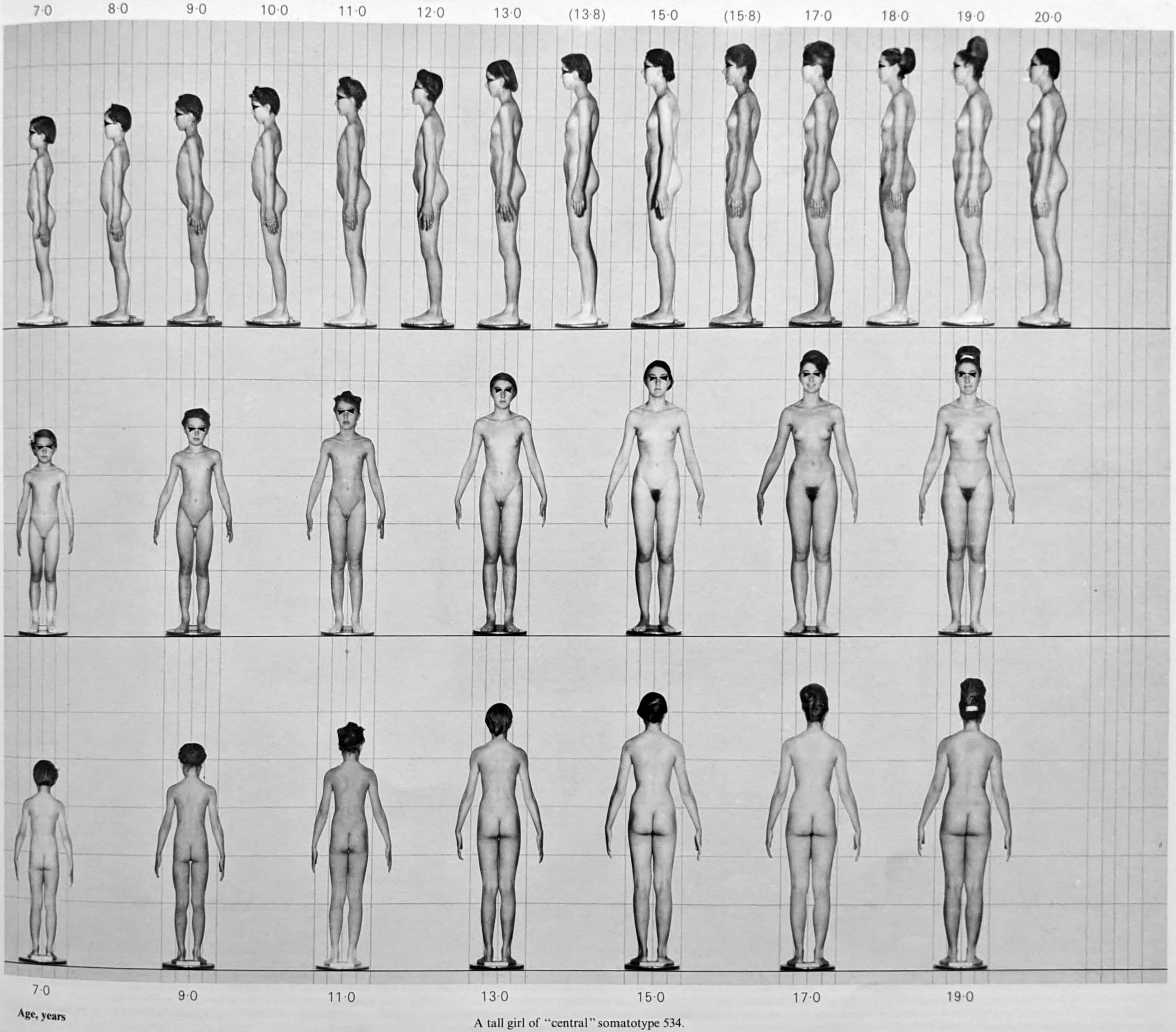
Subject No. 54

The last of our normal girls, somatotype 534, and a tall girl. Height is between the 90th and 97th centiles throughout. The height velocity curve shows a very smooth spurt, with the peak at about the 60th centile some 6 months later than average. This subject, who is presumably easy to measure, shows a practically constant height at 16, 17, 18 and 19, in contrast to the preceding subject. She has long legs at the 97th centile throughout, and sitting height mostly at about the 75th centile. The difference between the SDs lies between +1 and +2.

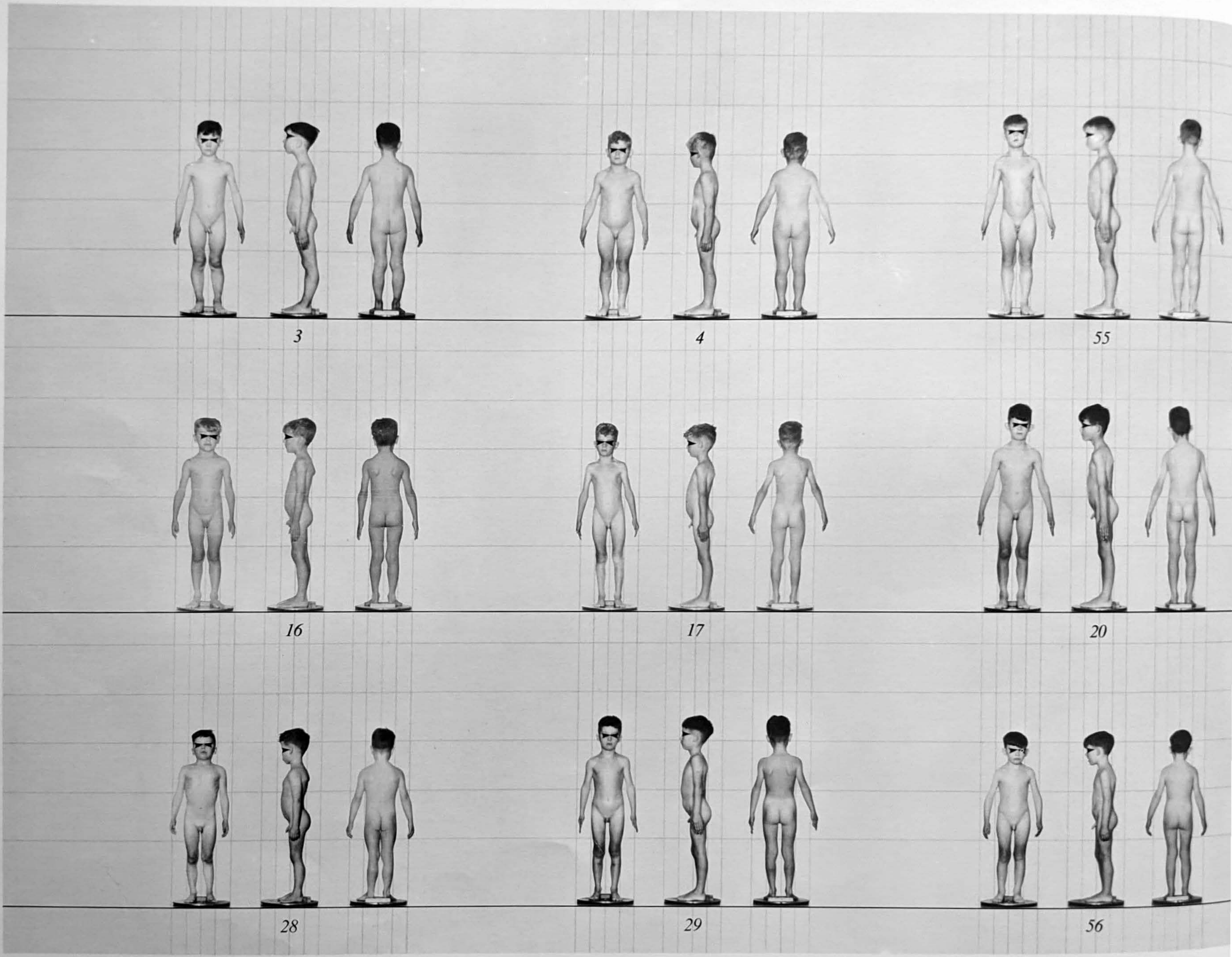
Biacromial diameter is initially and finally at the 75th centile and biiliac diameter is throughout at the 25th. Weight is around the 50th until the 19-year-old examination, when it rises to the 75th. Triceps skinfold rises from the 10th to the 50th, with a sharp drop around puberty, something which is usual in boys, but less so in girls.

Skeletal maturity is between the 50th and 75th but menarche, at 13·3 years, is at about the 40th. Breast and pubic hair development are much later than this, at about the 10th centile for timing. Thus, as in the previous subject, they are quite unusually discrepant.

The photographs show clearly a very consistent physique from 7 to 19 years.

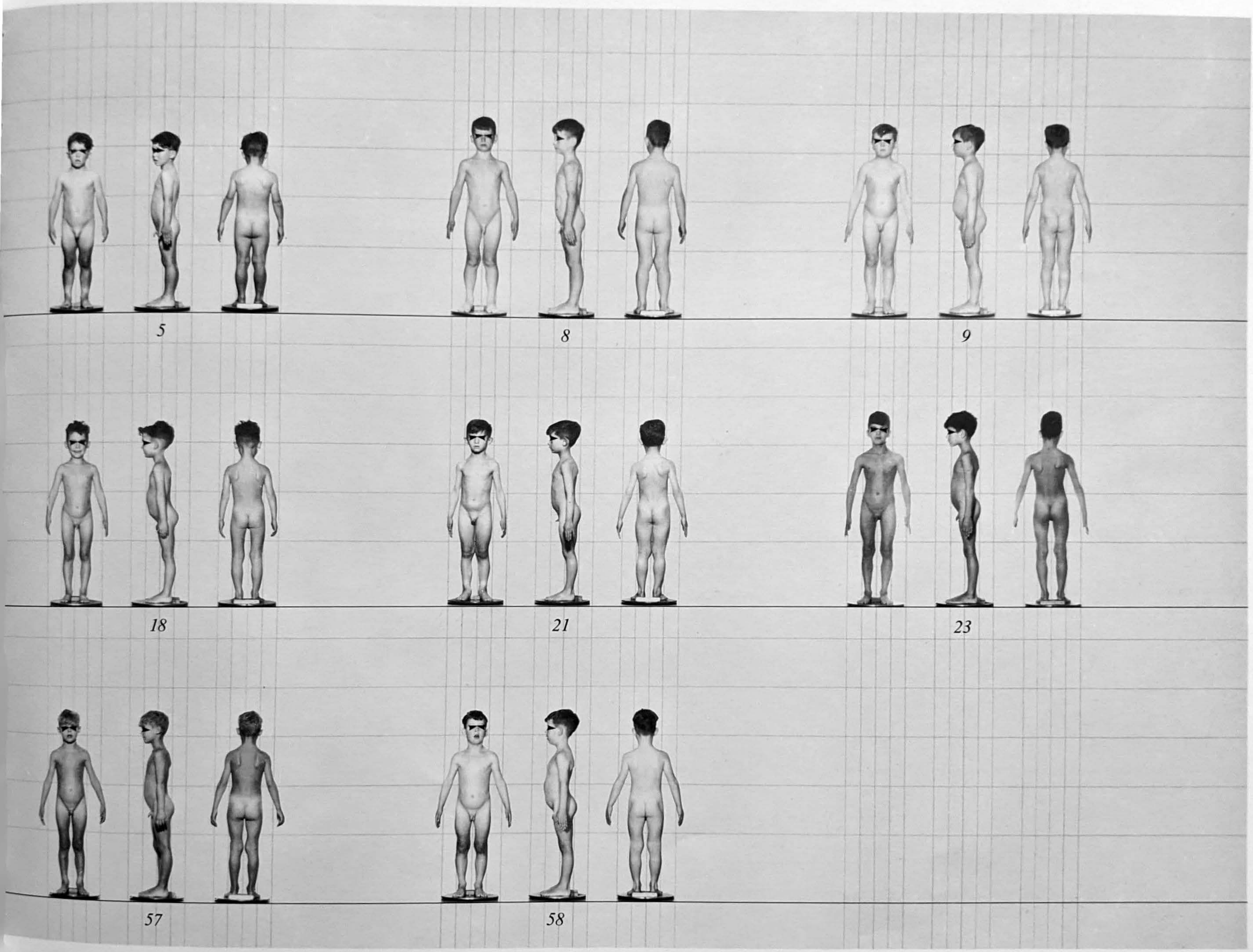


A tall girl of "central" somatotype 534.

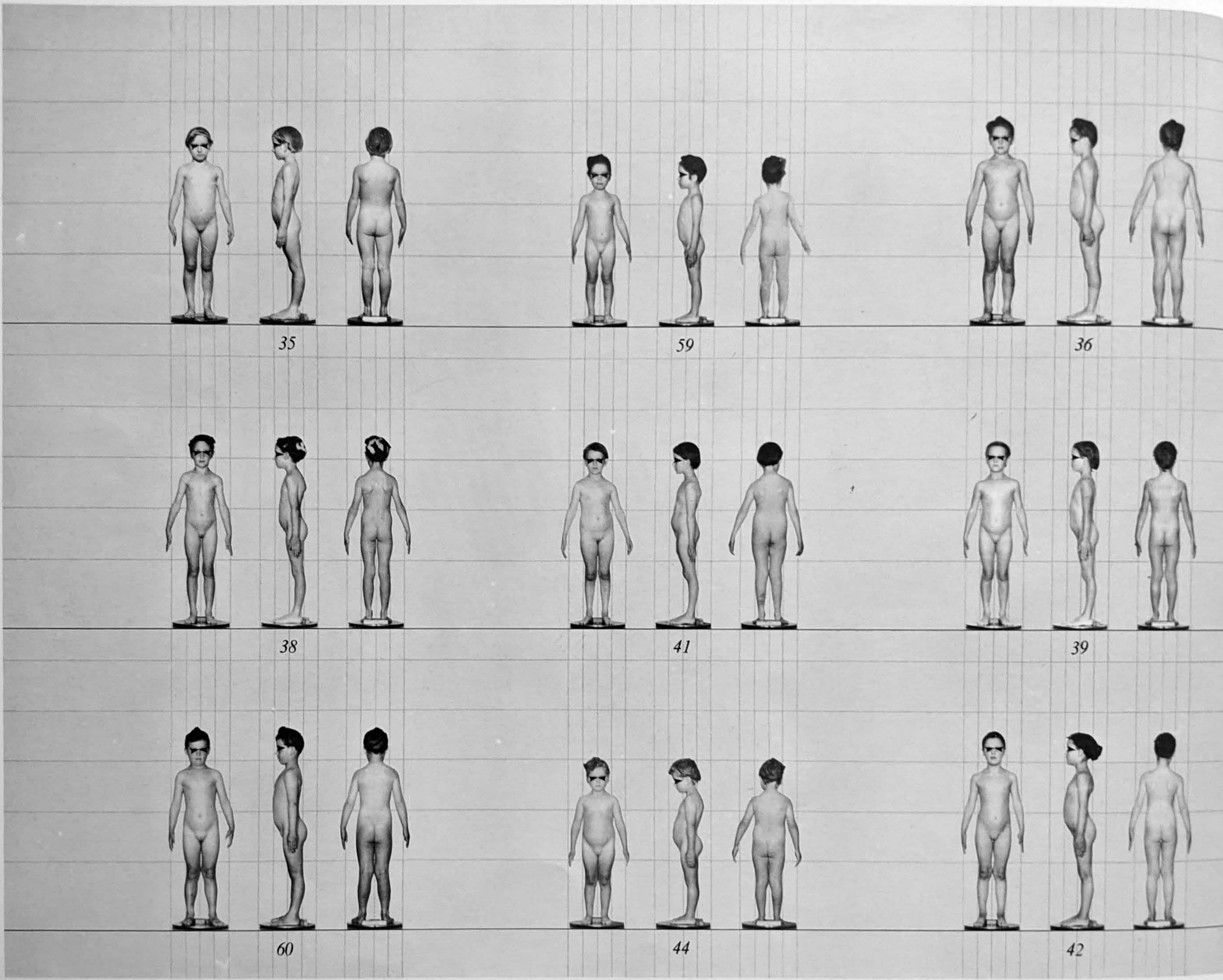


The appearance at age 6 of boys of somatotype (at age 18) extreme or high in one of the components. The *top row* (continued across to the facing page) shows six boys high in mesomorphy: somatotypes 2½5½2½; 2½5½2; 3½5½1½; 3½5½1½; 352; 354; the *middle row* six boys high in ectomorphy: somatotypes 226; 236, 33½5; 2½35; 244½; 334½; and the *bottom row* five boys high in endomorphy: somatotypes 434; 424; 424; 3½25; 442½. Illustrations of the growth, and the adult somatotype pictures of most of these subjects (i.e. nos 3–29) can be found in the preceding pages.

These pictures show that somatotyping 6-year-olds is not particularly easy. The changes in muscle and fat, and the subtle rearrangements, especially at adolescence, of centile positions of shoulders and hips, trunks and legs, seem at first to present almost insuperable barriers to the appraising eye.

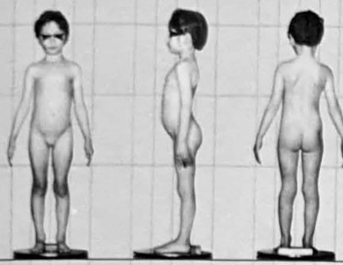


Dr Richard Walker of the Gesell Institute, New Haven, a long-time collaborator of William Sheldon, rated 82 boys of the present series at ages 5, 8, 11, 14 and 18 years, each age considered wholly independently. His correlations between ratings at 5 years and ratings at 18 years were 0·47, 0·77 and 0·74 for endomorphy, mesomorphy and ectomorphy respectively. Between ratings at 8 and 18 years they were 0·72, 0·83 and 0·82 respectively. This means that four times out of five Walker estimated the adult somatotype components to within ±1·0, ±0·8 and ±0·8 units at age 5, within ±0·9, ±0·7 and ±0·7 units at age 8 and within ±0·8, ±0·6 and ±0·7 units at age 14 (Walker and Tanner, 1980). Re-estimations on the same adult pictures are only within about ±0·4 units 80% of the time, so it seems that a well-trained eye can pick up the underlying continuity of body shape and composition even as early as age 5. To the neophyte, the first child in the middle row, no. 16, scarcely looks like the 226 he certainly grew up to be. Yet Walker's worst estimates of his somatotype would have been, say, 335 or 11½6½.



Our material permits the presentation at age 6 of fewer girls than boys with known and fairly extreme somatotypes. The *top row* shows five girls high in mesomorphy: somatotypes 43½3; 43½3; 5½33; 532; 533; the *middle row* three high in ectomorphy: somatotypes 435; 514; 424; and the *bottom row* five high in endomorphy: somatotypes 722; 612; 622; 632; 633.

As in the boys' case, assessment of adult somatotype is far from easy. The ectomorphs in the middle row look more slender than the others (though no. 48, fourth in the top row, seems, quite unjustifiably, to rival them). Distinguishing endomorphy and mesomorphy is even harder than in the adult. Even the first girl in the bottom row (no. 60) who later declares a rating of 7 in endomorphy (722) seems not very different from no. 59 in the top



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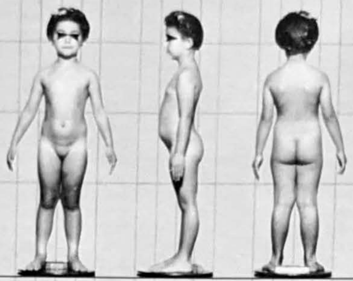

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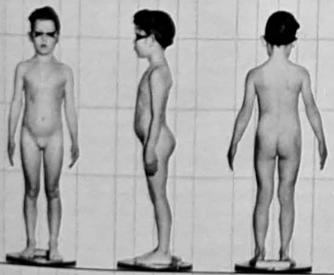

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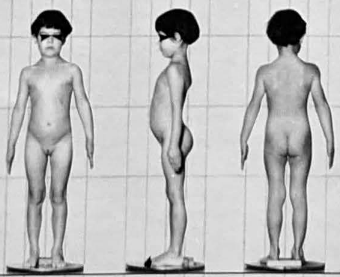


43

row (somatotype 43½3) though on careful consideration the differences agree well with the differences in adult somatotype. Perhaps the second girl in the bottom row (no. 44) looks the most endomorphic; she develops into a 612, so assessment is made easier by the marked lack of mesomorphy. Perhaps, all in all, female somatotypes may be a little easier to disentangle before puberty than male ones, because of the smaller change in muscle and other androgen-sensitive dimensions.

The adult somatotype pictures of all but two of these subjects can be found in the preceding pages (i.e. subjects nos 2, 35–50).

Relative Constancy of Size and Shape during Growth

These two pages endeavour to clarify the issue of relative constancy of size and shape during childhood. The first question is, to what extent can we predict the mature size of a child knowing his size at, e.g., age 1, 5 or 10? Secondly, and in direct relation to the issue of the prediction of adult somatotype dealt with on pp. 116–119, to what extent can we foresee the shape of the adult from the shape at earlier ages? This is a more complicated matter and is illustrated on the page opposite.

The table on this page shows the correlation coefficients between height at successive ages and mature final height. At each age males are on the upper lines, females in italics on the lower lines. The correlation coefficient is a statistic showing how closely one may predict one of two measurements from the other. It ranges from 0 to 1. Thus if there were no relation at all between height at age 5 and mature height, the correlation coefficient would be zero; if the height at age 5 told one exactly what height at maturity would be then the correlation would be 1. Neither of these things occurs; the truth lies in between and the actual correlation is about 0·8. This does not imply that one can predict the mature height from height at age 5 to the extent (in some sense) of 80%, since the correlation coefficient does not rise in a linear way, but proportionate to its square. Thus, in slightly more statistical language, a coefficient of 0·8 implies that not 80% but 64% of the adult variation of height is accounted for by height at age 5 or is implicit in it; 36% of the variation still remains. This implies that considerable inaccuracy in predicting the height of a given individual is still present.

The measure of the limits within which our predicted value will lie is given by the standard deviation around the predicted value. The standard deviation of the height of adult men is about 6·5 cm. This means that 95% of adult men lie within ± 2 × 6·5 = 13·0 cm around the average height. If now we know the height at age 5, we can predict the height of an individual with a diminution of these limits, specifically to $6{\cdot}5 \times \sqrt{0{\cdot}36} = 6{\cdot}5 \times 0{\cdot}6 = 3{\cdot}9$ cm. Thus the limits of individual prediction have narrowed to $3{\cdot}9/6{\cdot}5 \times 100$ or 60% of what they would be if we had simply to guess the adult height without anything to go on. The figures on this page present our results in these terms. The vertical scales are labelled to show the percentage of uncertainty remaining, hence nearly 100% at birth and 0% at adulthood.

These charts are based on children followed till growth had ceased, as judged by a gain of less than 1 cm in height over the last measurement interval of at least 1 year. Most of the mature heights were taken at ages 17, 18 or 19 in girls and 18, 19 or 20 in boys. A problem arises with children who reach mature height relatively early and then leave the study. If values for them are omitted at later ages the correlation becomes erroneously biased. Hence we have continued the same mature value for subsequent years; thus if a boy attained mature height at 16 and then quit the study, we have put in the 16-year-old values at 17 and 18. This will slightly increase the correlation at the upper ages for such measurements as weight, skinfolds and arm and thigh circumferences where diminution of size could actually occur; however, the error in this direction is less than the error in the other direction incurred by omitting their values altogether. About half of the children were followed from 1 month after birth and half from an age varying between 4 and 8 years. The total numbers are given in the table. All were healthy.

Length at 1 month of age (Fig. 1 this page, table this page) has a low correlation with mature height. During the first year the correlation rises greatly, but it is still only about 0·65 at age 1·0. By age 2·0, however, it is around 0·75 and by age 3·0 it is nearly 0·8; to a considerable extent mature height is now determined, given adequate later environmental circumstances (which all these charts assume throughout). From this age the coefficient rises only slightly, to reach about 0·85 immediately before puberty. During the years of adolescent spurt the coefficient drops, simply because some children have early and some late spurts and this makes prediction of mature height inefficient unless one knows whether the spurt has occurred or not. (Prediction can still be made, but bone age must be used instead of, or together with, chronological age in the equations set forth in Tanner *et al.*, 1975b.) The age curve of these coefficients tells us, then, first, that length in infancy is not much of a guide to mature height, and second, that considerable independence exists between height gain up to puberty and height gain during puberty, for a correlation of 0·85 implies that the width of the limits of prediction for an individual have been diminished only by 50%, as shown in the figure. There are individual differences in the amount of the adolescent gain which are rather independent of the amount of growth before the spurt (and perhaps are governed by whether or not the parents had a large spurt, though we have no evidence about this).

The other charts are constructed in the same way. Figures 3 and 4 show that what is true for height is almost equally true for its components, sitting height and leg length, though the latter takes a little longer to reach its stable position after birth, especially, it seems, in girls. It also has a lower dip at adolescence.

Biacromial diameter (Fig. 5) attains a correlation of only 0·75 before puberty; so the amount of the spurt is of greater importance in its final determination. Biiliac diameter (Fig. 6) is better predicted before puberty in boys though not in girls, in whom the correlation is very similar to that of biacromial diameter. Skinfold has lower correlations and a much more gradual rise, reflecting the much greater lability of fat, which can actually be lost as well as gained during growth.

Correlation Coefficients of Measurements at each Year with Adult Measurements
(top row of each pair: boys; bottom row of each pair: girls)

Age (years)	Height/ length	Sitting height	Leg length	Biacromial diameter	Biiliac diameter	Weight	Triceps skinfold	No. of cases
0·08	0·33	0·14	0·50	—	0·30	0·36	0·15	36
	0·27	*0·19*	*0·19*	—	*0·26*	*0·13*	*−0·01*	*33*
0·50	0·58	0·47	0·48	—	0·54	0·57	−0·08	43
	0·60	*0·48*	*0·43*	—	*0·43*	*0·22*	*0·11*	*36*
1·0	0·71	0·71	0·57	—	0·59	0·61	−0·14	35
	0·60	*0·56*	*0·34*	—	*0·49*	*0·42*	*0·07*	*35*
2·0	0·80	0·60	0·71	0·56	0·77	0·76	0·27	40
	0·66	*0·59*	*0·57*	*0·70*	*0·45*	*0·63*	*0·00*	*39*
3·0	0·81	0·72	0·73	0·65	0·72	0·80	0·43	49
	0·75	*0·70*	*0·60*	*0·70*	*0·57*	*0·76*	*0·09*	*39*
4·0	0·81	0·76	0·75	0·69	0·85	0·75	0·22	55
	0·75	*0·65*	*0·51*	*0·71*	*0·72*	*0·72*	*0·16*	*50*
5·0	0·83	0·75	0·79	0·68	0·86	0·75	0·45	66
	0·75	*0·74*	*0·57*	*0·74*	*0·74*	*0·71*	*0·09*	*59*
6·0	0·83	0·75	0·81	0·72	0·90	0·79	0·51	73
	0·78	*0·78*	*0·68*	*0·68*	*0·71*	*0·68*	*0·30*	*65*
7·0	0·84	0·78	0·81	0·72	0·87	0·76	0·59	73
	0·79	*0·79*	*0·73*	*0·70*	*0·71*	*0·61*	*0·35*	*72*
8·0	0·87	0·80	0·87	0·74	0·90	0·78	0·68	79
	0·81	*0·82*	*0·77*	*0·69*	*0·72*	*0·61*	*0·31*	*75*
9·0	0·89	0·81	0·88	0·72	0·88	0·76	0·60	81
	0·77	*0·79*	*0·73*	*0·71*	*0·74*	*0·61*	*0·39*	*75*
10·0	0·88	0·82	0·87	0·75	0·88	0·76	0·70	88
	0·73	*0·75*	*0·70*	*0·72*	*0·74*	*0·61*	*0·45*	*76*
11·0	0·87	0·82	0·86	0·73	0·85	0·69	0·66	92
	0·67	*0·71*	*0·69*	*0·65*	*0·69*	*0·58*	*0·34*	*76*
12·0	0·83	0·80	0·83	0·74	0·85	0·69	0·63	95
	0·67	*0·66*	*0·72*	*0·66*	*0·65*	*0·59*	*0·44*	*76*
13·0	0·73	0·68	0·78	0·67	0·83	0·64	0·62	93
	0·73	*0·71*	*0·84*	*0·70*	*0·70*	*0·63*	*0·47*	*73*
14·0	0·70	0·64	0·78	0·66	0·82	0·63	0·68	89
	0·85	*0·79*	*0·93*	*0·73*	*0·78*	*0·69*	*0·55*	*72*
15·0	0·81	0·70	0·91	0·72	0·89	0·71	0·72	88
	0·94	*0·89*	*0·97*	*0·86*	*0·88*	*0·80*	*0·63*	*72*
16·0	0·94	0·84	0·98	0·83	0·95	0·84	0·70	87
	0·98	*0·95*	*0·99*	*0·94*	*0·94*	*0·90*	*0·71*	*71*
17·0	0·99	0·95	0·99	0·93	0·97	0·92	0·84	89
	1·00	*0·97*	*0·99*	*0·96*	*0·96*	*0·93*	*0·79*	*71*
18·0	1·00	0·97	0·99	0·97	0·98	0·96	0·88	85
	1·00	*0·98*	*0·99*	*0·97*	*0·97*	*0·93*	*0·78*	*57*
19·0	1·00	0·97	0·99	0·97	0·99	0·97	0·89	82

italic numbers = girls

It is clear from these charts that size of the body, which is represented by the skeletal measurements, is quite highly predictable (as fatness is not). In the remaining chart, (Fig. 2) the sum of sitting height, leg length, biacromial and biiliac diameters is plotted (actually the sum of the standard deviation scores of the measurements, so that they are all reduced to the same scale). The curve followed, which is very similar to but slightly above that for height, represents the predictability of mature size (excluding fatness). Evidently, the predictability is reasonably high after age 2.

Figs 1–8. In all figures the vertical scale represents the percentage of uncertainty remaining: girls (○- - -○); boys (●——●).

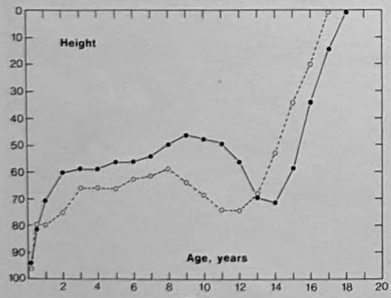


Fig. 1.

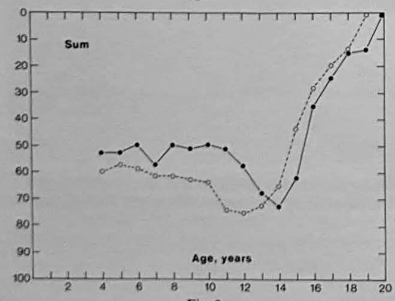


Fig. 2.

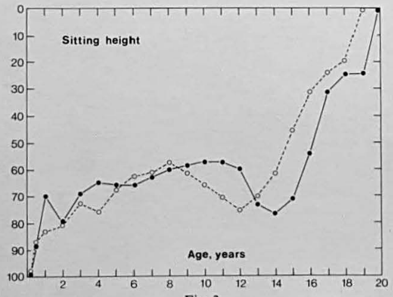


Fig. 3.

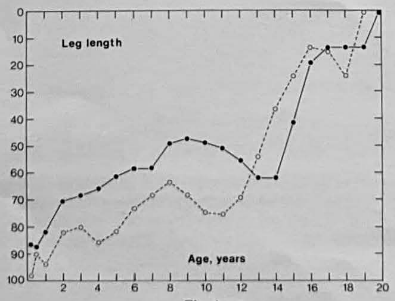


Fig. 4.

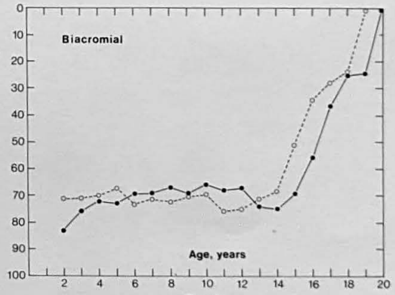


Fig. 5.

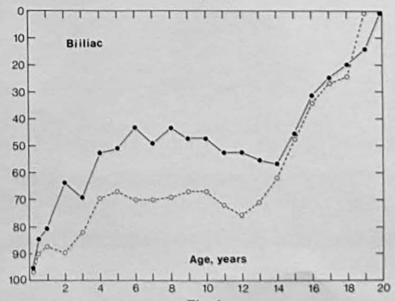


Fig. 6.

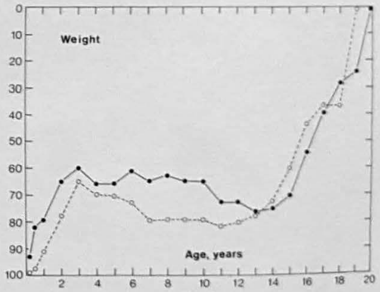


Fig. 7.

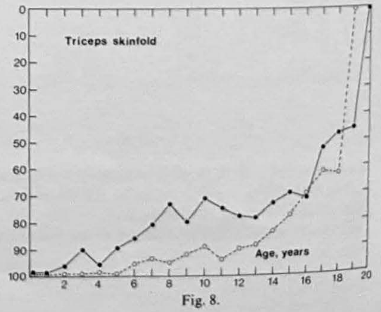


Fig. 8.

Figs 1–10. *Vertical scales*: Figs 1–4 = percentage of uncertainty remaining; Fig. 5 = $K_{biacromial}$; Fig. 6 = $K_{biiliac}$; Fig. 7 = $K_{leg\ length}$; Fig. 8 = K_{height}; Figs 9 and 10 = relative shape change in SD units.

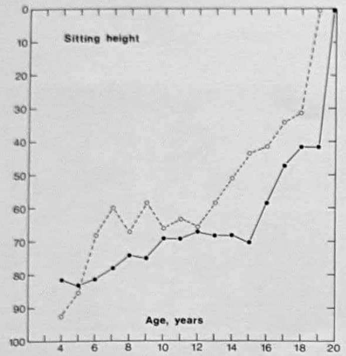


Fig. 1.

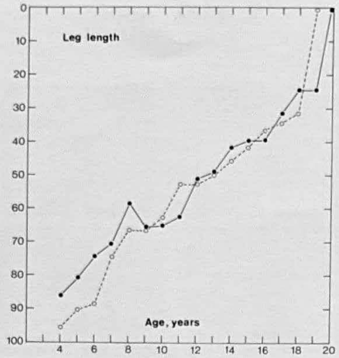


Fig. 2.

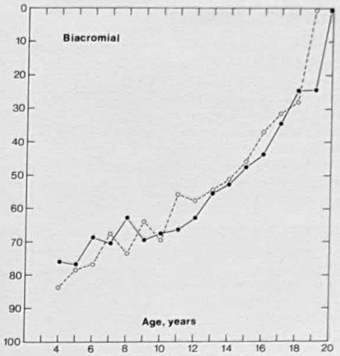


Fig. 3.

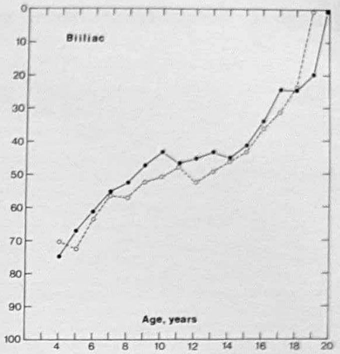


Fig. 4.

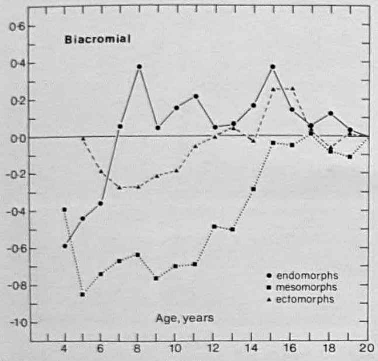


Fig. 5.

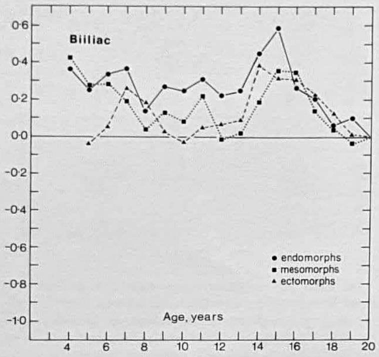
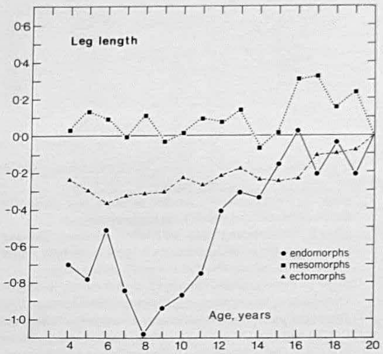


Fig. 6.



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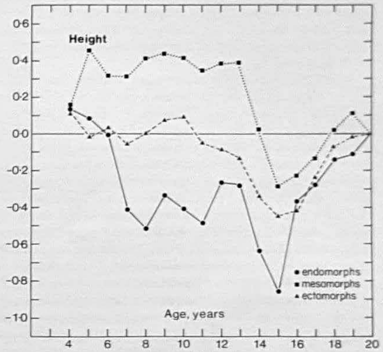


Fig. 8.

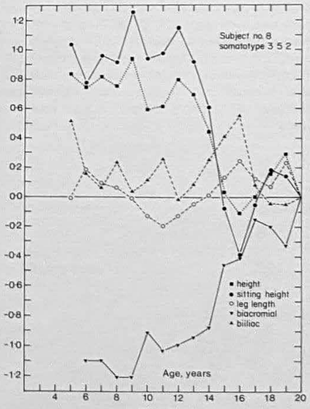


Fig. 9.

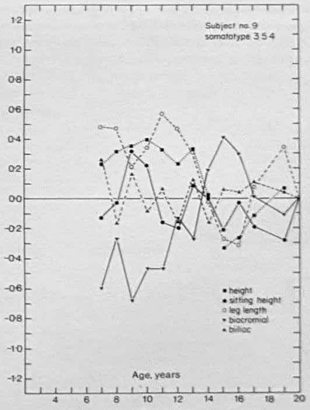


Fig. 10.

Predictability of Shape

Assessing the predictability of shape is more difficult. The mathematics of measuring shape can be complex, but we have used simple methods, depending only on SD scores.

If a boy aged 6 has SD scores of +2, 0, 0 and −2 in sitting height, leg length, biacromial and biiliac diameters then he has a long back for his legs and small hips for his sitting height or his biacromial diameter, compared with other 6-year-olds (whose mean scores will be 0, 0, 0, 0). If, at maturity, he has the same SD scores (in relation to all mature boys) then neither his size nor shape have altered relative to those of other boys. If his scores are +3, +1, +1, −1, his size has increased by 1SD but his shape has remained the same (since 1SD has been added to each measurement). If his scores become, +2, 0, −2, 0 then he has changed shape, his hips being much larger, relatively, than before and his shoulders, relatively, much less, but his overall size (which is represented by the sum of the SD scores) has not changed; it is still average, as it was at age 6.

By these calculations we obtain some insight into the constancy or otherwise of skeletal shape during childhood. To see how biacromial diameter changes relative to the other measurements we have calculated biacromial SD scores at each age and subtracted from them the average of the SD scores of sitting height, leg length and biiliac diameter at the same age. If the shoulders are large, the difference is positive— if small, the difference is negative. Then, to see whether large shoulders stay large, we have calculated the correlation coefficients of these shoulder-differences at successive ages with those at maturity, and, treating them like height on the page opposite, have plotted the curve representing predictability (Fig. 3, this page). At age 4 the correlation with adult status is about 0·6 and the predictability rises steadily, without any drop at adolescence. Just before puberty the correlation reaches 0·75 to 0·8, which is a little higher than the corresponding correlation of biacromial diameter itself with its adult value. It seems therefore that relatively wide shoulders can be predicted from age 5 or 6 just as well (if no better) than relatively large size.

Figure 1 shows the same curve for sitting height, Fig. 2 for leg length, and Fig. 4 for biiliac diameter. The correlations for relative sitting height are lower and less rapidly established than those for sitting height (p. 120, Fig. 3); immediately before the spurt they average nearer 0·7 than 0·8. Relative stature, i.e. stature relative to the two body breadths only (not illustrated) is also less predictable than absolute stature up till about age 8. After this, predictability is a little higher with no great drop at puberty. At adolescence there is less reassortment of skeletal linearity than of skeletal size. In general, though skeletal shape may take a little longer to settle into its groove than skeletal size, after about age 8 it is fixed to just about the same degree.

We return now to the difficulty shown on pp. 116—119 in estimating adult somatotype from appearance at age 5 or 6. At least *some* aspects of shape–skeletal shape, shorn of muscle and fat–*are* predictable, if not quite so easily from age 5, at least from age 8. Thus the problem does not seem to be so intractable as it appeared, and indeed Walker's correlations for mesomorphy and ectomorphy on p. 117 agree with our results here.

The remaining figures on this page show how boys of extreme somatotypes as adults changed in shape during childhood. Let us first consider changes in biacromial diameter relative to the three other skeletal measurements. We want to consider changes occurring in single individuals, e.g. "At age 5 was this boy's biacromial diameter as prominent a feature of his physique as it was at age 20?" To see the change from age 5 to 20, we calculate the SDs for biacromial at age 5 and 20 and subtract the latter from the former. If the difference is, say, +1 then the child had a larger shoulder width relative to his group of children at 5 than he did at 20. This may be due to a size change, however. So we now calculate the same changes for the other three measurements and then see if the shoulder width relative change is greater or less than the average of the changes of the other three. If greater, then the boy in question was at age 5 broader-shouldered than he was as an adult. The mathematical formula is as follows: $K_{biac}=D_{biac}-\frac{1}{3}(D_{biil}+D_{sit}+D_{sll})$ where D_{biac} represents the (SDs at child age less SDs at adult age) for biacromial, D_{biil} the same for biiliac etc. and K_{biac} is the relative shape change we wish to measure.

Figure 5 shows the values at successive ages for K_{biac}, not for an individual but for the means of the six extreme mesomorphs (■····■), six extreme ectomorphs (▲---▲) and five extreme endomorphs (●——●), illustrated on pp. 116–117. The most striking feature of the chart is that the mesomorphs have much less prominent shoulders as children than as adults; only at puberty does their line swing back from negative towards zero, which represents their adult status. Thus we must not expect to find such relatively prominent shoulders in 5-year-old mesomorphs. The differences between the other two groups are less; endomorphs have slightly more impressive shoulders as children than as adults, ectomorphs the reverse.

Figure 6 shows the situation for biiliac diameter; Figure 7 shows leg length. The endomorphs have strikingly short legs as children, even compared to their build as adults. Mesomorphs, on the contrary, keep very much the same proportions of leg to rest of skeleton. Figure 8 shows stature relative to the two widths. The three groups differ considerably; mesomorphs are more linear as children than as adults, the ectomorphs about the same and the endomorphs less linear.

The four charts show that the extreme endomorph at age 5 will have relatively shorter legs, lower height, and wider body breadth than later; his endomorphic physique will appear exaggerated. In contrast, the extreme mesomorph will have a deceptively linear physique and relatively smaller shoulders and so, perhaps, be particularly difficult to spot.

Finally, in Figs 9 and 10 the curves for two individuals are shown. Both are high in mesomorphy; Fig. 9 is subject no. 8 somatotype 352 (see p. 22) and Fig. 10 subject no. 9 somatotype 354 (see p. 24). Height, sitting height, leg length, biacromial and biiliac diameters are plotted. Both show the less impressive biacromial diameter characteristic of mesomorphs in childhood, but in another way they are in contrast. The lines for subject 8 in Fig. 9 spread over a much wider range than those for subject 9 in Fig. 10. This implies that, as a child, the first subject deviates in a variety of directions from his adult physique much more than the second child does. The spread of the lines measures changes during childhood in what Sheldon called "dysplasia" and Renaissance artists "disproportion". Its study should certainly tell us something about the biological control of shape.

There are very large variations in the ages at which the various manifestations of puberty occur in girls and boys. These variations take three forms.

1. Early or late occurrence of puberty as a whole.
2. Differences in timing between different sequences; i.e. say, pubic hair early in relation to breasts, or peak height velocity (PHV) early in relation to testis enlargement.
3. Differences in the rapidity with which each individual sequence progresses; that is, between the time taken by one girl to pass from the earliest breast bud to an adult breast compared with the time taken by another who starts breast development at the same age.

The top two rows of pictures on p. 123 opposite (Figs 1 and 2) illustrate strikingly the first type of variation. The three boys are all aged exactly 14·5 years; the three girls are all exactly 12·8 years. The first individual in each series shows no signs of puberty and the last is practically mature. Below the figures are the panels for charting secondary sex character development, placed over the height velocity charts (Figs 3 and 6, p. 123). In each panel only the earliest-maturing and latest-maturing individuals have been plotted, leaving out the middle individual for reasons of clarity.

Though the development of secondary sex characters such as breasts and pubic hair cannot be measured quantitatively, like height, the semi-quantitative scales illustrated on this page may be used (Figs 1, 2, 3). Breasts and pubic hair in girls and penis-with-scrotum and pubic hair in boys are rated on scales of 1 to 5, 1 representing the pre-pubertal status and 5 the young adult condition. Axillary hair (not shown here) is rated on a 3-point scale, 1 being no hair, 3 an adult quantity and 2 intermediate. The testis size is measured by comparison with a series of models, illustrated below (Fig. 4), called the Prader-Zachmann orchidometer (Zachmann *et al*., 1974). The comparison is made by palpating testes and models successively. The models are of volumes 1 ml to 25 ml. Pre-pubertal testes are either size 1 or 2, or occasionally 3, whereas adult testes are usually 15, 20 or 25, though occasionally 12 ml may represent an adult figure. In the height velocity chart (Fig. 3, p. 123) only two sizes are given for reasons of space. The size 4 ml is chosen because it represents the first pubertal increase, and 12 ml because it is a size reached by all normal adult males.

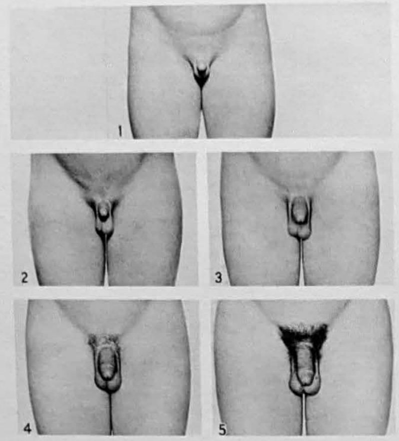


Fig. 1.

The genitalia development stages, illustrated above, are as follows:

Stage 1. Pre-adolescent. Testes, scrotum and penis are about same size and shape as in early childhood.
Stage 2. Scrotum and testes are slightly enlarged. The skin of the scrotum is reddened and changed in texture. There is little or no enlargement of the penis at this stage.
Stage 3. Penis is slightly enlarged, at first mainly in length. Testes and scrotum are further enlarged than in stage 2.
Stage 4. Penis is further enlarged, with growth in breadth and development of glans. Scrotum is further enlarged than in stage 3, and scrotum skin is darker than in earlier stages.
Stage 5. Genitalia are adult in size and shape.

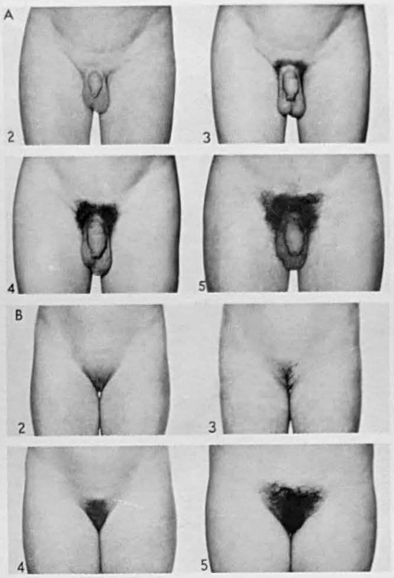


Fig. 2.

The pubic hair stages, of which stages 2–5 are illustrated above for boys (A) and girls (B), are as follows:

Stage 1. Pre-adolescent. The vellus over the pubes is not further developed than that over the abdominal wall, i.e. no pubic hair.
Stage 2. There is sparse growth of long, slightly pigmented downy hair, straight, or slightly curled, chiefly at the base of the penis or along the labia.
Stage 3. The hair is considerably darker, coarser and more curled. It spreads sparsely over the junction of the pubes.
Stage 4. Hair is now adult in type, but the area covered is still considerably smaller than in the adult. There is no spread to the medial surface of the thighs.
Stage 5. The hair is adult in quantity and type with distribution of the horizontal (or classically "feminine") pattern. Spread is to the medial surface of the thighs, but not up the linea alba or elsewhere above the base of the inverse triangle.

In about 80% of men and 10% of women the pubic hair spreads further, but this takes some time to occur after stage 5 has been reached. When it does happen, the pubic hair is rated 6, a terminology which retains the uniform rating for males and females on the 5-point scale and at the same time places this longer-term development beyond the more concentrated period of adolescence.

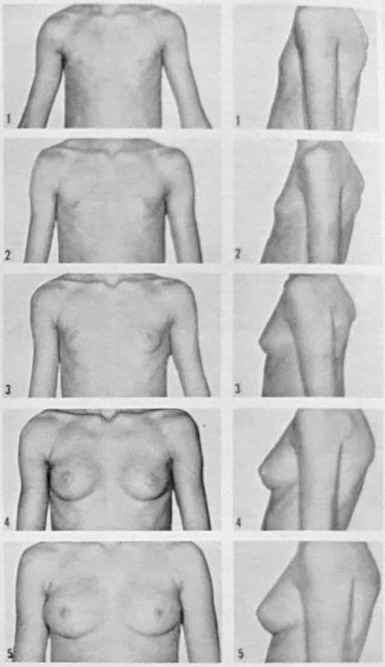


Fig. 3.

The breast development stages, illustrated above, are as follows:

Stage 1. Pre-adolescent. There is elevation of the papilla only.
Stage 2. Breast and bud stage. There is elevation of the breast and the papilla as a small mound. Areolar diameter is enlarged over stage 1.
Stage 3. Breast and areola are both enlarged and elevated more than in stage 2, but with no separation of their contours.
Stage 4. The areola and papilla form a secondary mound projecting above the contour of the breast.
Stage 5. Mature stage. Only the papilla projects, with areola recessed to the general contour of the breast.

In some girls stage 4 development never occurs. When it does occur, it may persist well into adulthood. Thus stages 4 and 5 are not distinct in all girls.

Figure 4 shows the Prader-Zachmann orchidometer. Figure 5 (centre) shows centiles for testis size in a normal West European population using this method (Taranger *et al*., 1976; van Wieringen *et al*., 1971). The testis size recorded is the size of the model to which the testis most closely approximates (whether it is a little more or a little less).

Figure 6 (far right) shows height-attained charts of two boys, one early and the other late in maturing. Both are about the same height before puberty. The effects on the late maturer of such a drastic falling behind (not only in height, but in strength and sexual development also) can easily be imagined. Yet the falling behind is temporary; eventually both reach the same adult height. This is true in general of early and late maturerers; there is no correlation between final height and age of pubertal events, nor between final height and age of peak height velocity, either in boys or in girls.

Fig. 4.

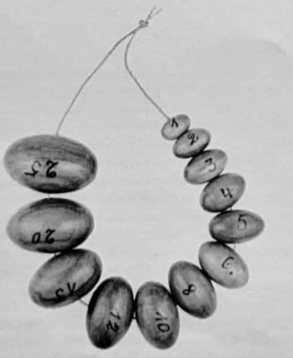


Fig. 5.

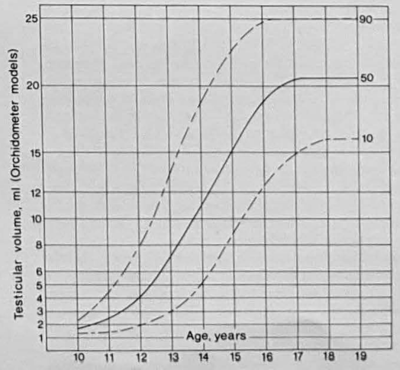
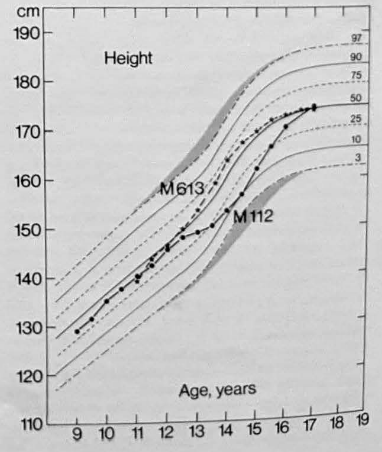


Fig. 6.



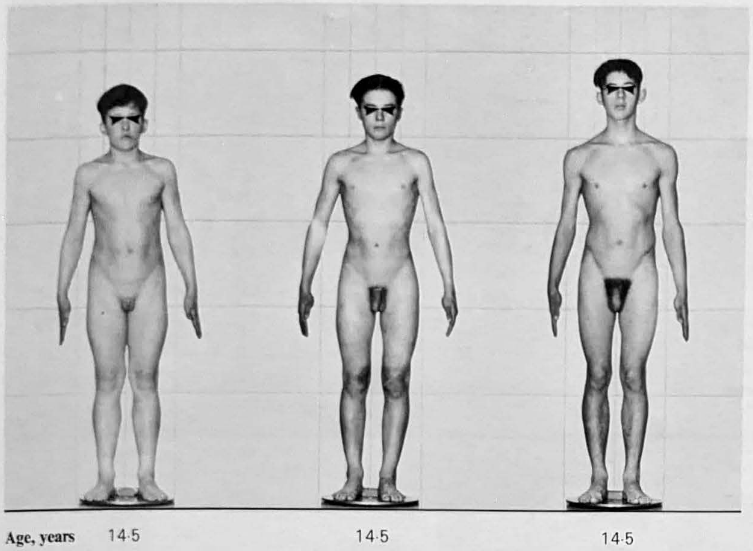


Fig 1 (left). Boys.

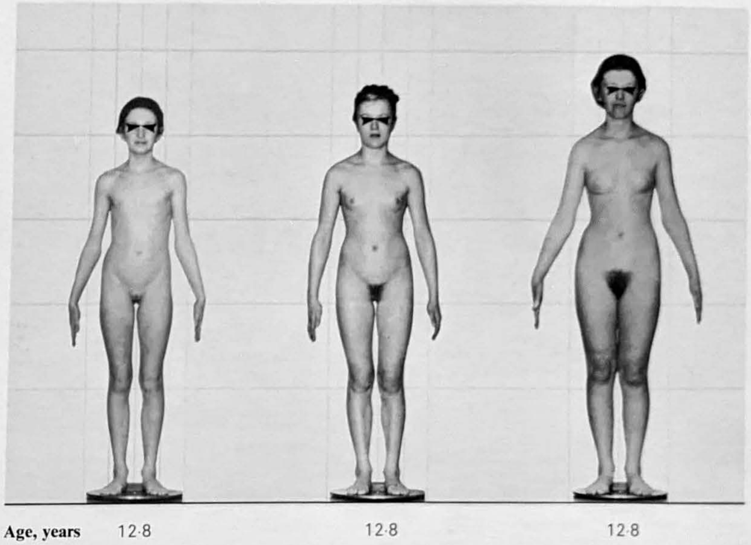


Fig. 2 (right). Girls.

The three boys shown above (Fig. 1) aged 14·5 have ratings of genitalia (penis-with-scrotum), pubic hair and axillary hair of 111, 332 and 553 respectively. The testes sizes (right and left) are 2/2, 12/12 and 20/20. The three girls (Fig. 2) aged 12·8 have ratings for breasts, pubic hair, axillary hair and menarche (0=absent, 1=present) of 1110, 3220 and 5531 respectively. The details of the timings of these secondary sex character developments are shown in the upper portion of Figs 3 and 6.

Centile ranges are given for the ages at which normal individuals are found in a certain stage, for example the stage which stretches from the first moment at which the appearance B2 arises to the moment of its transition to the appearance B3. The moment of first appearance of a stage is, of course, impossible to pinpoint with absolute accuracy, but the terminology is important; B2, B3, B4 and so on represent moments of *transition* into the new stages. The stages, therefore, are best called B2+, B3+, B4+ etc. and stretch from the transition points B2 to B3, B3 to B4 and B4 to B5. B5+ is open-ended, since that stage continues indefinitely. The labelling of early maturation as the 97th centile and late maturing as the 3rd centile is arbitrary; the reverse would have been just as correct. Each time the individual is seen a rating is made, as shown in the chart. The average of all the ratings of stage B2+, for example, (available only when B3 is reached) may be taken as the age at which the individual was "typically" in stage B2+. If the age of transition is wanted, then the best estimate would be an age half-way between the last rating B2+ and the first rating B3+.

The height velocity curves of the three boys (Fig. 3) and three girls (Fig. 6) are shown, together with their curves of RUS bone maturity scores (Figs 4 and 5). The three boys had their peak height velocities at 12·5, 14·5 and 16·5 years respectively and effectively finished growing in height at ages 15·5, 17·5 and 19·5 years. The three girls had peak height velocities at 11·0, 12·0 and 14·0 years and their ages of menarche, indicated by arrows in the chart, were 11·6, 13·0 and 15·0 years. The bone maturity scores show the early, middling and late maturation of the bones. In the boys the late maturer is ahead of the middling maturer till age 14. Though this is relatively unusual, it illustrates the point that the later stages of skeletal maturation are under different influences from the earlier ones and thus progression after age 14 in boys and 12 in girls is to a considerable degree independent of progression earlier. Boys and girls who lack sex steroids have RUS bone ages which stick indefinitely at about 14 "years" and 12 to 13 "years" respectively, unless testosterone or oestrogen is administered. Thus, in a late developer the RUS bone age may reach this far and then pause, awaiting the advent of the hormonal increase.

Fig. 3.

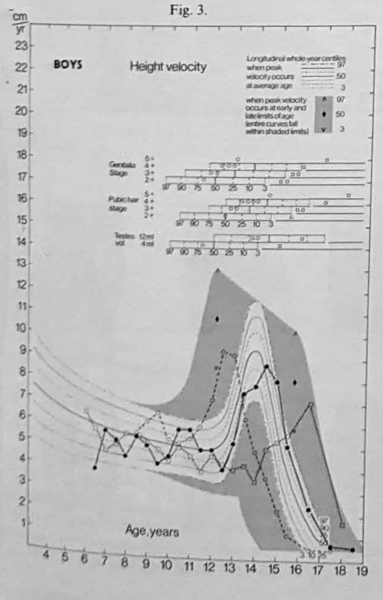


Fig. 4.

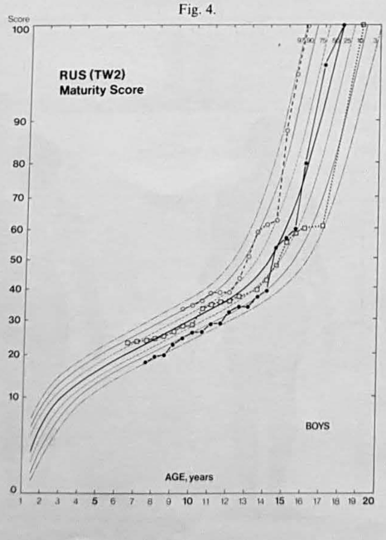


Fig. 5.

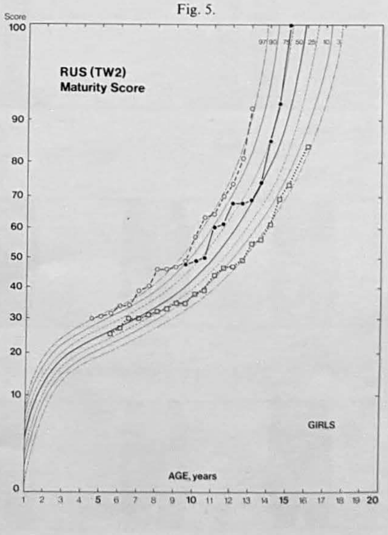
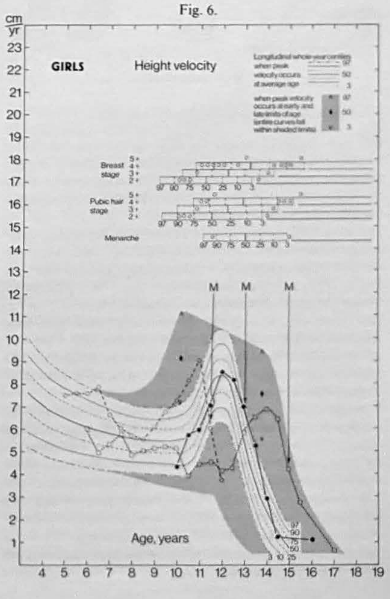


Fig. 6.



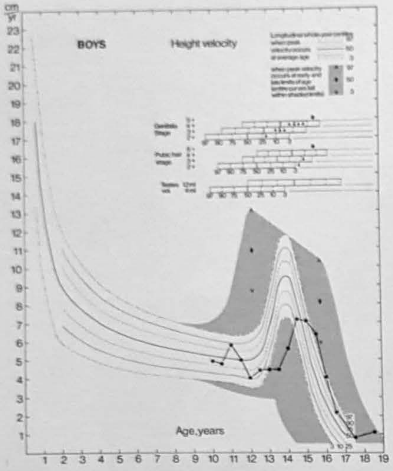


Fig. 1. Subject P1.

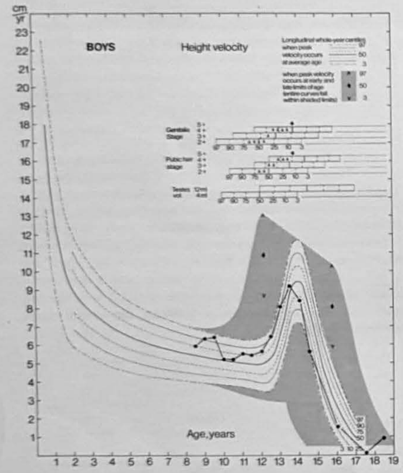


Fig. 3. Subject P2.

Variation in Timing at Puberty (Boys)

This page shows in the top two rows the variation in timing between the developmental sequences of the different characteristics of puberty (pubic hair, genitalia). In the bottom row is shown the variation in the rapidity with which a single sequence (such as pubic hair) is completed.

Top row: (Fig. 2) Boy (P1) with genitalia developing early compared with pubic hair. Pictures are at 13·5, 14·0, 14·5, 15·0 and 15·5 years and ratings of genitalia and pubic hair are 3,1; 3,1; 4,1; 4,3; 5,4. Peak height velocity is at 14·5 years (40th centile of timing). The ratings are plotted in Fig. 1.

Middle row: (Fig. 4) Boy (P2) with pubic hair developing early compared with genitalia. Pictures are at 12·0, 12·5, 13·0, 13·5 and 14·0 years and ratings of genitalia and pubic hair are 2,1; 3,3; 4,4; 5,5; 5,5. Peak height velocity is at 13·5 (60th centile of timing). The ratings are plotted in Fig. 3.

Bottom row: The first comparison (Figs 5 and 7) is between fast and slow development of genitalia; the second comparison (Figs 6 and 8) is between fast and slow development of pubic hair. In each comparison the middle picture represents the first occasion on which the rating 2 was given; the first picture is a year earlier (for comparison with the second to illustrate how the diagnosis of stage 2 is made) and the third picture 1 year later. *Genitalia:* ratings 1, 2, 5 and ratings 1, 2, 3. *Pubic hair:* ratings 1, 2, 5 and ratings 1, 2, 3. The rating PH2 is hard to see in photographs, but clear on the subject himself.

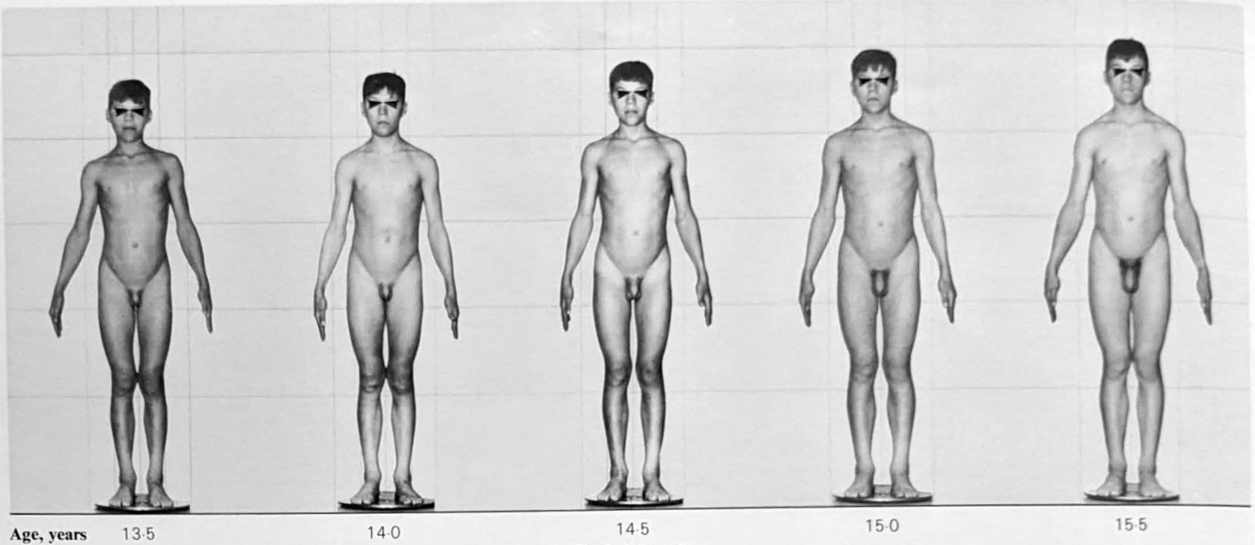


Fig. 2. Subject P1.

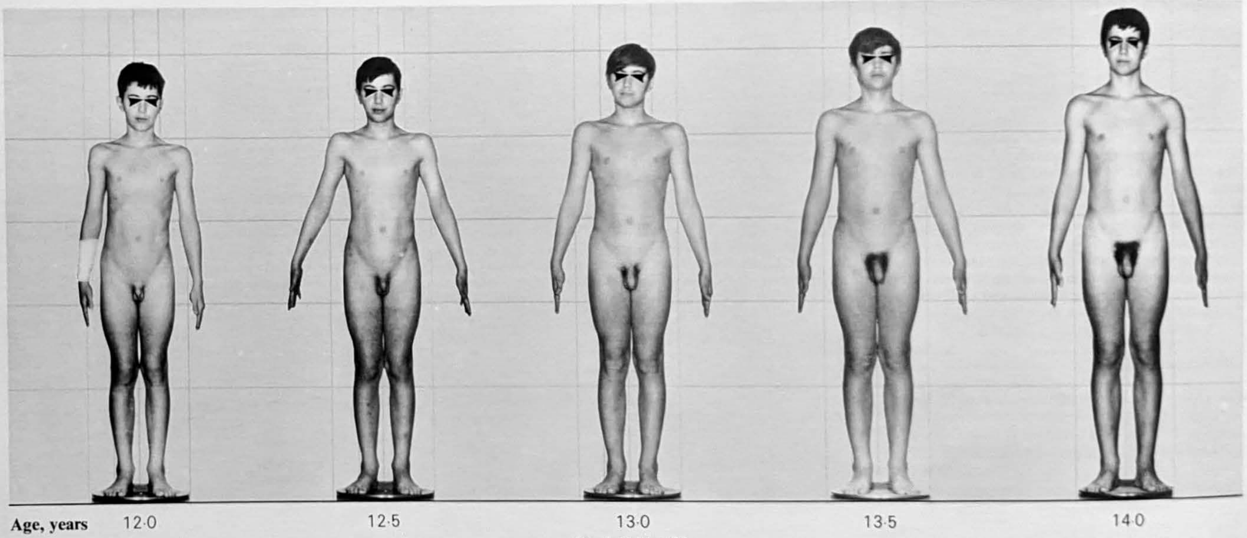


Fig. 4. Subject P2.

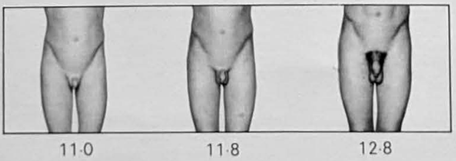


Fig. 5. Fast development of genitalia.

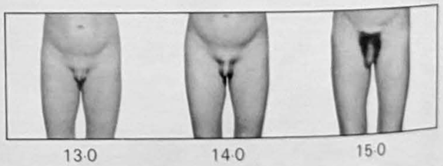


Fig. 6. Fast pubic hair development.

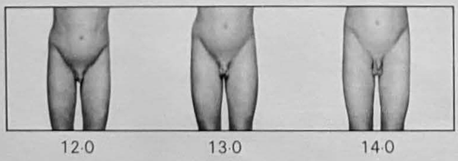


Fig. 7. Slow development of genitalia.

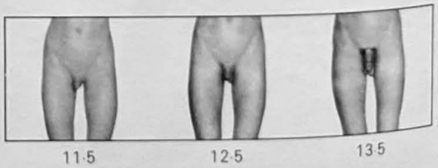


Fig. 8. Slow pubic hair development.

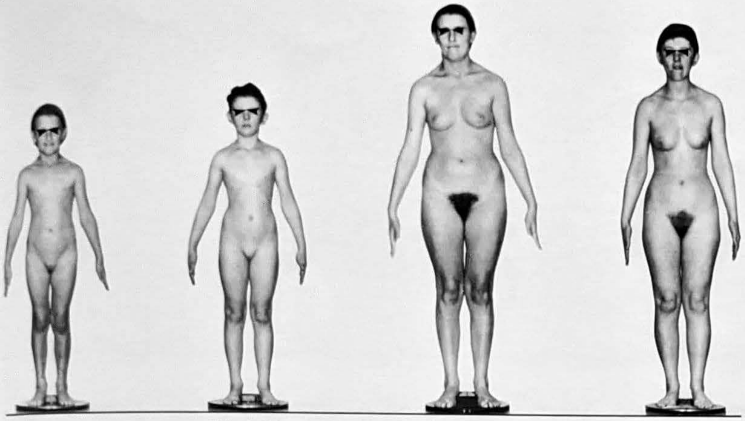


Fig. 1. (left to right). Subjects nos P4, P5, P4, P5.

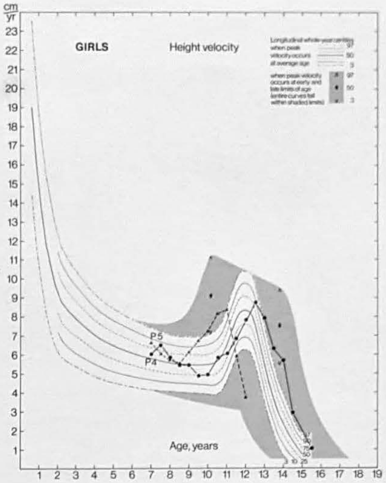


Fig. 2.

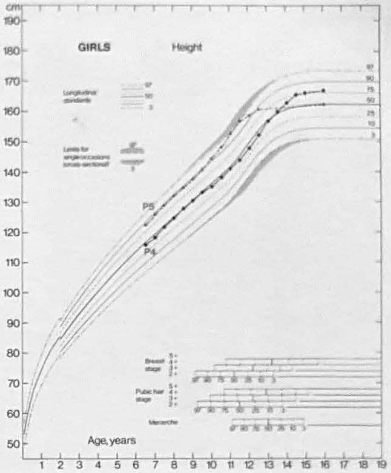


Fig. 3.

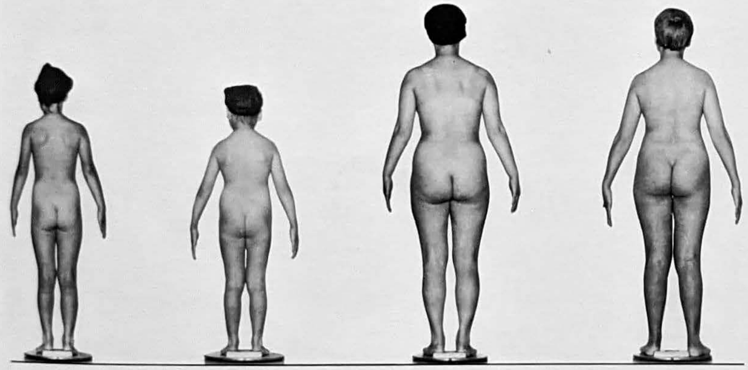


Fig. 4 (left to right). Subjects nos P6, 44 (pre-puberty); P6, 44 (post-puberty). The photograph of no. P6 on the far left has been enlarged so that her biiliac diameter equals that of no. 44 in the adjacent photograph. The two right-hand photographs were then enlarged using the same magnification. Note greater increase in shoulder width at puberty in no. P6.

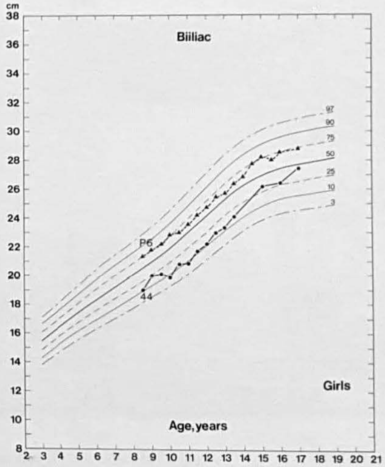


Fig. 5.

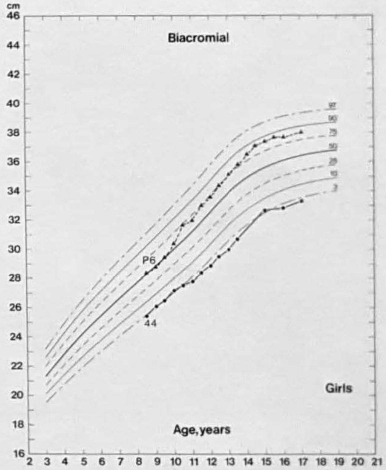


Fig. 6.

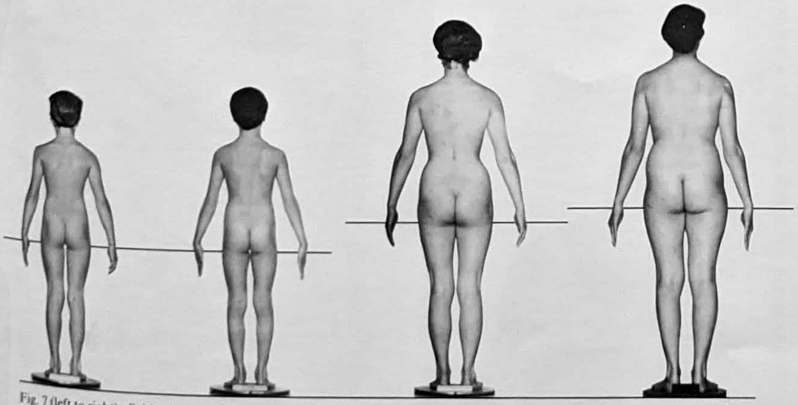


Fig. 7 (left to right). Subjects nos P7, 39 (pre-puberty); P7, 39 (post-puberty). The photograph of no. P7 on the far left has been enlarged so that her leg length equals that of no. 39 in the adjacent photograph. The two right-hand prints were then enlarged using the same magnification. Lines have been added to emphasize the greater increase in leg length at puberty in no. 39.

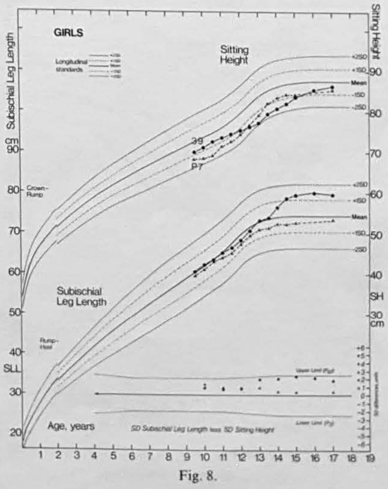


Fig. 8.

Variation in Size and Shape Changes Caused by the Adolescent Spurt (Girls)

The first pair of subjects (P4 and P5) illustrate changes in height centile position at puberty (Figs 1, 2, 3). Subject no. P4 rises from the 50th to the 75th centile while P5 drops from the 80th to the 50th. The height velocity curves show that in this instance the mechanism is not the same as in the pair of boys illustrated in Fig. 1, p. 126. The height spurts in the girls are quite similar in intensity, but one takes place much earlier than the other. Figure 1 shows the girls at age 8·5 and maturity.

The second row (Figs 4, 5, 6) shows relative differences in shoulder and hip width change. Subject no. P6 has a large increase in biacromial diameter, from 50th to 80th centile, with a constant biiliac centile position. Subject no. 44 sinks a fraction in biacromial centile and rises in biiliac. Girls show this shape differentiation much less clearly than boys, and our sample of girls is also rather smaller than that of boys. The pictures show the comparison, with the pictures enlarged to give equal biiliac diameter at the first age.

The third row (Figs 7 and 8) illustrates differences in leg length and sitting height. Subject no. 39 has a large increase in leg length while staying at a nearly constant centile position in sitting height; subject no. P7 stays practically constant in leg length and increases slightly her centile position in sitting height. The pictures have been enlarged to give the same leg length in the first pair.

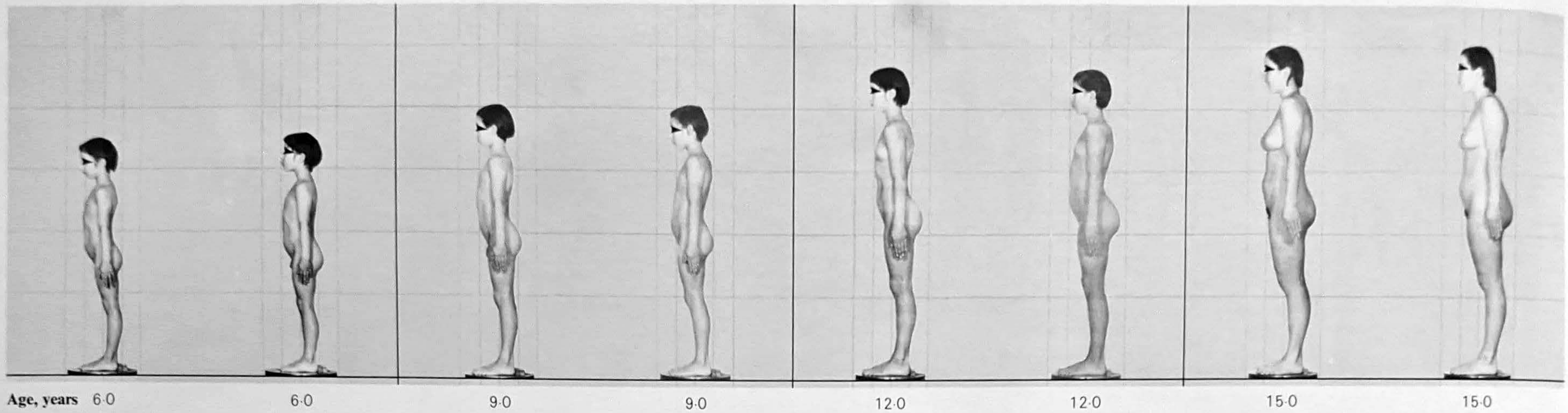


Fig. 1. The left subject of each pair of twins is no. 45; the right no. 61.

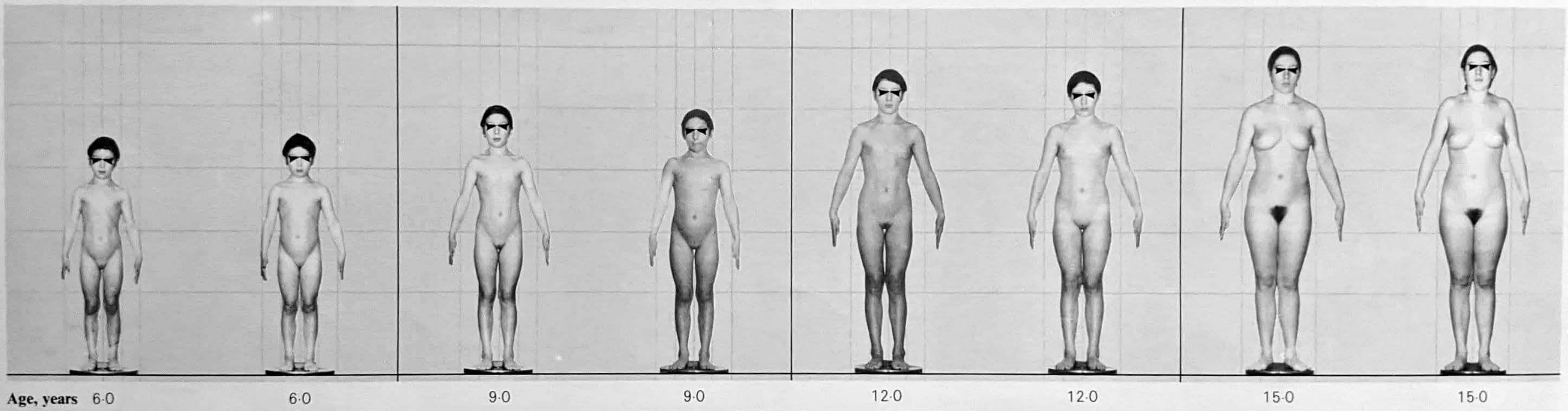


Fig. 2. The left subject of each pair of twins is no. 45; the right no. 61.

Identical Twins *Subjects Nos 45 and 61*

A pair of monozygotic twins followed from age 6 to maturity (subjects 45 and 61). All aspects of growth show great similarity; menarche occurred in the same week in both twins, though no. 45 was very slightly ahead in development of breasts and pubic hair, as also in her height spurt. The height velocity curves are similar (even to the small increase at age 9) except that no. 61 has a higher peak. The sitting height/leg length chart (Fig. 5) shows slightly greater differences in sitting height than in leg length; both girls have relatively short legs. Birth-weights were both 2320 g. The growth curves of their three sisters are given on pp. 132–133.

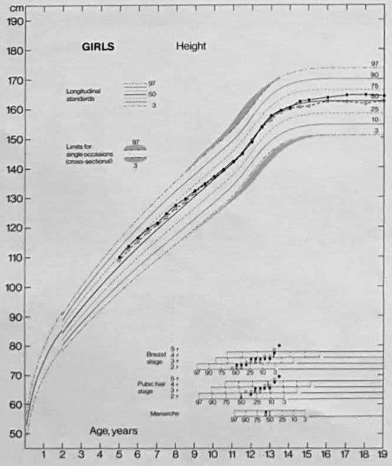


Fig. 3. □ subject 45; ● subject 61.

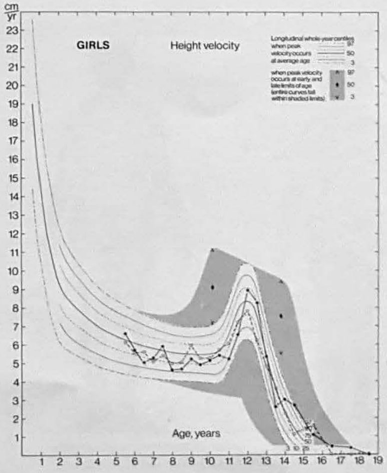


Fig. 4. □ subject 45; ● subject 61.

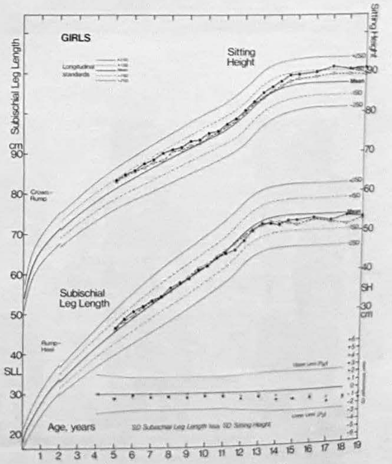


Fig. 5. □ subject 45; ● subject 61.

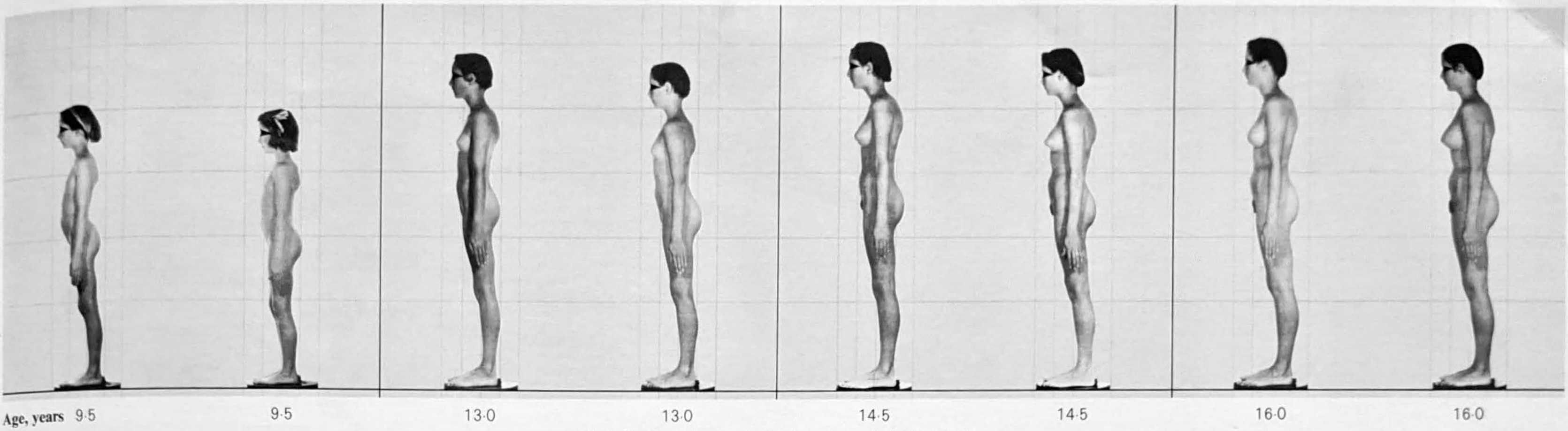


Fig. 1. The left subject of each pair of twins is no. 62; the right no. 63.

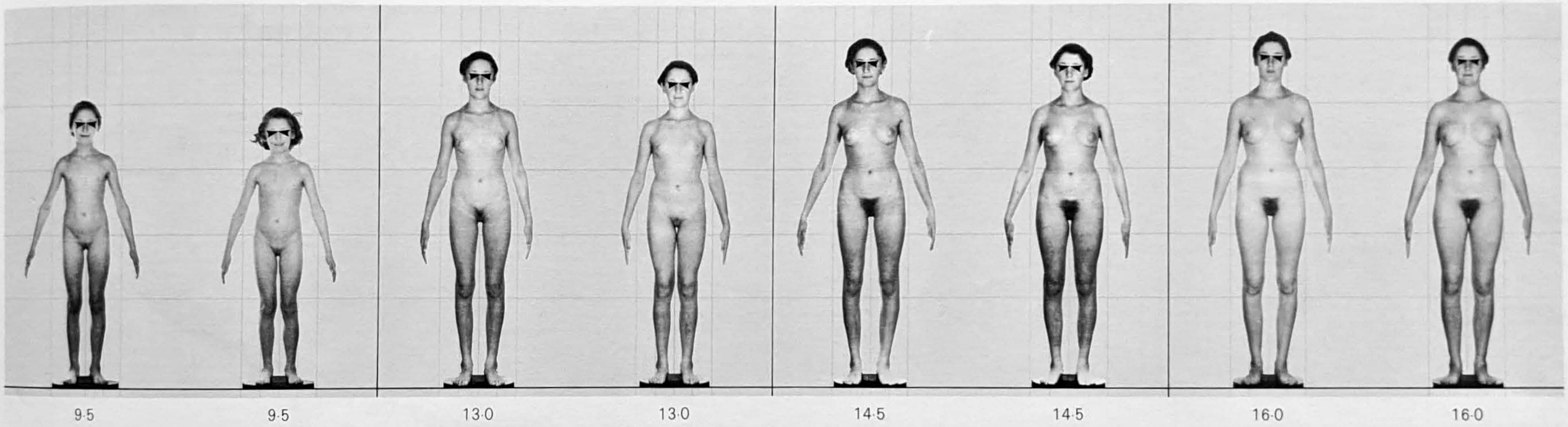


Fig. 2. The left subject of each pair of twins is no. 62; the right no. 63.

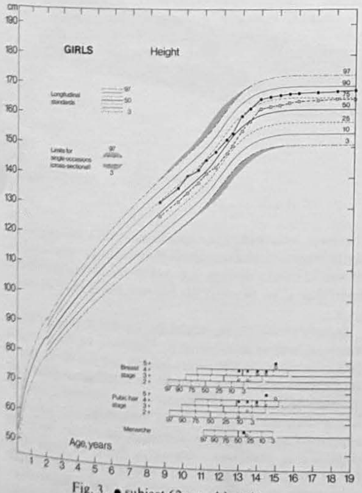


Fig. 3. ● subject 62; □ subject 63.

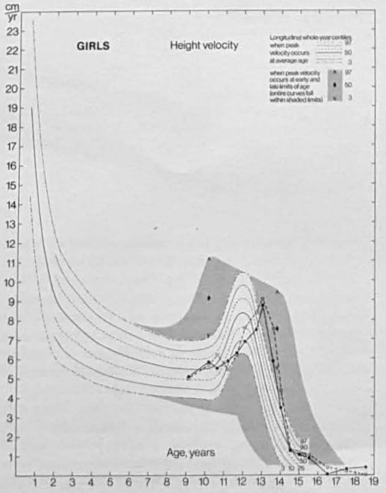


Fig. 4. ● subject 62; □ subject 63.

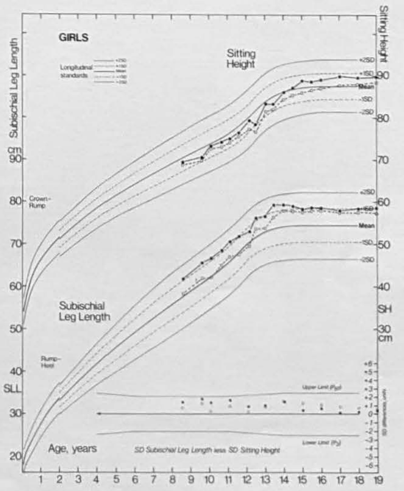


Fig. 5. ● subject 62; □ subject 63.

Identical Twins *Subjects Nos 62 and 63*

Another pair of monozygotic twins (subjects 62 and 63) showing a difference in size but a similarity in shape. The height difference was about 3 cm at all ages from 8 to maturity and was associated with a difference in prenatal growth as represented by birthweights of 2040 g and 1930 g (no. 62, firstborn, and no. 63, secondborn, respectively). No. 62 is slightly ahead of no. 63 in skeletal maturity and has menarche 0·2 years earlier but this only accounts for a small fraction of the height difference. In breast and pubic hair development no. 62 is also slightly earlier, but in age at peak height velocity the twins are equal. Oddly, the height difference is initially due chiefly to a difference in leg length, but this disappears at puberty to be replaced by a greater difference than previously in sitting height. Thus, at first, no. 62 has proportionately the longer legs and from age 15 to 18 no. 63 does; but by age 19 the proportions have become identical in the two, and very close to average.

Biacromial diameter (not shown here) is about 1 cm greater in no. 62 from 8 to maturity and biiliac diameter is some 0·5 cm greater. Body shape and facial features were so similar, however, that few people could tell the twins apart; they took each others places in swimming competitions and in the classroom without anyone realizing.

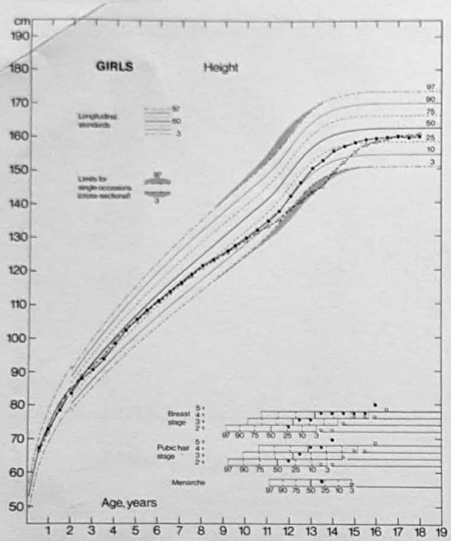


Fig. 1. □ subject no. 64; ● subject no. 65.

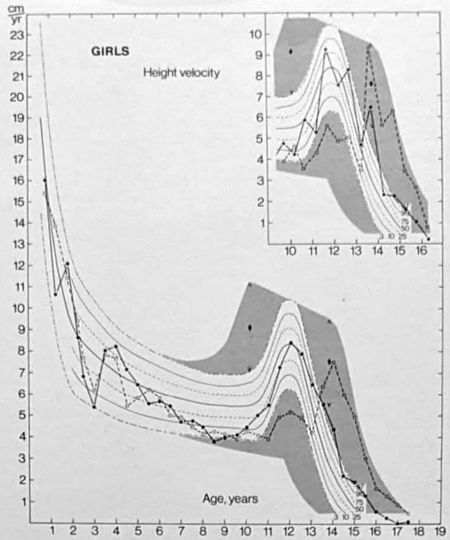


Fig. 2. □ subject no. 64; ● subject no. 65.

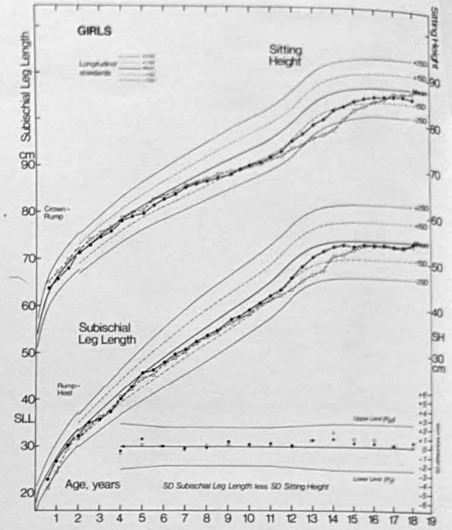


Fig. 3. □ subject no. 64; ● subject no. 65.

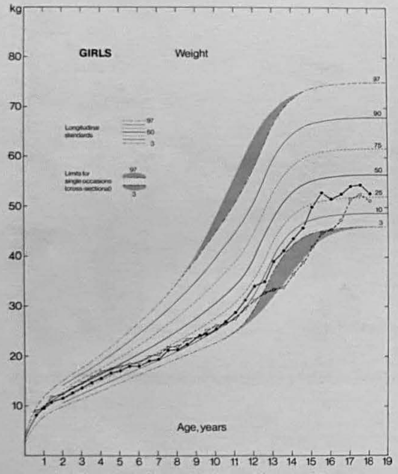


Fig. 4. □ subject no. 64; ● subject no. 65.

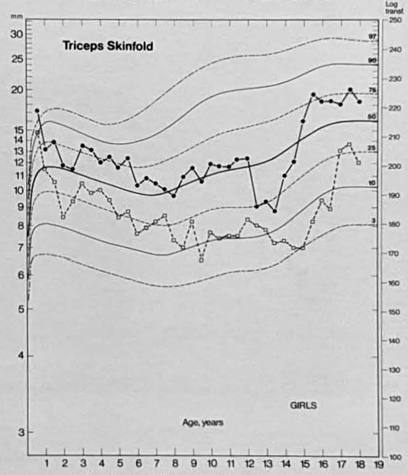


Fig. 5. □ subject no. 64; ● subject no. 65.

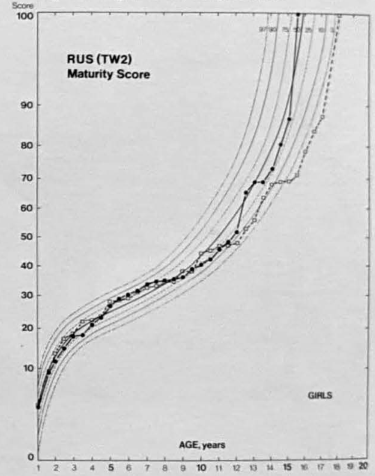


Fig. 6. □ subject no. 64; ● subject no. 65.

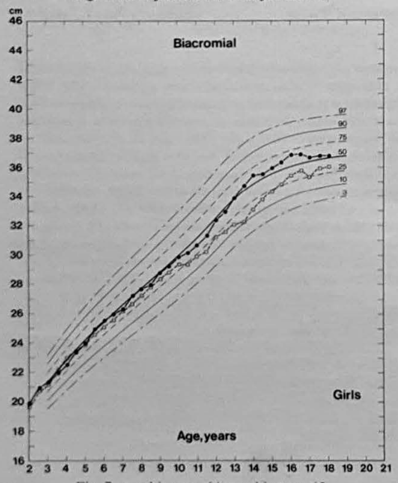


Fig. 7. □ subject no. 64; ● subject no. 65.

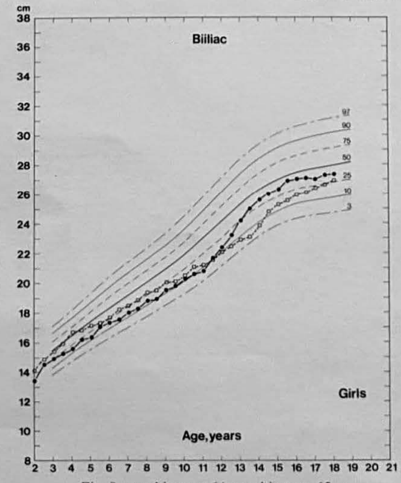


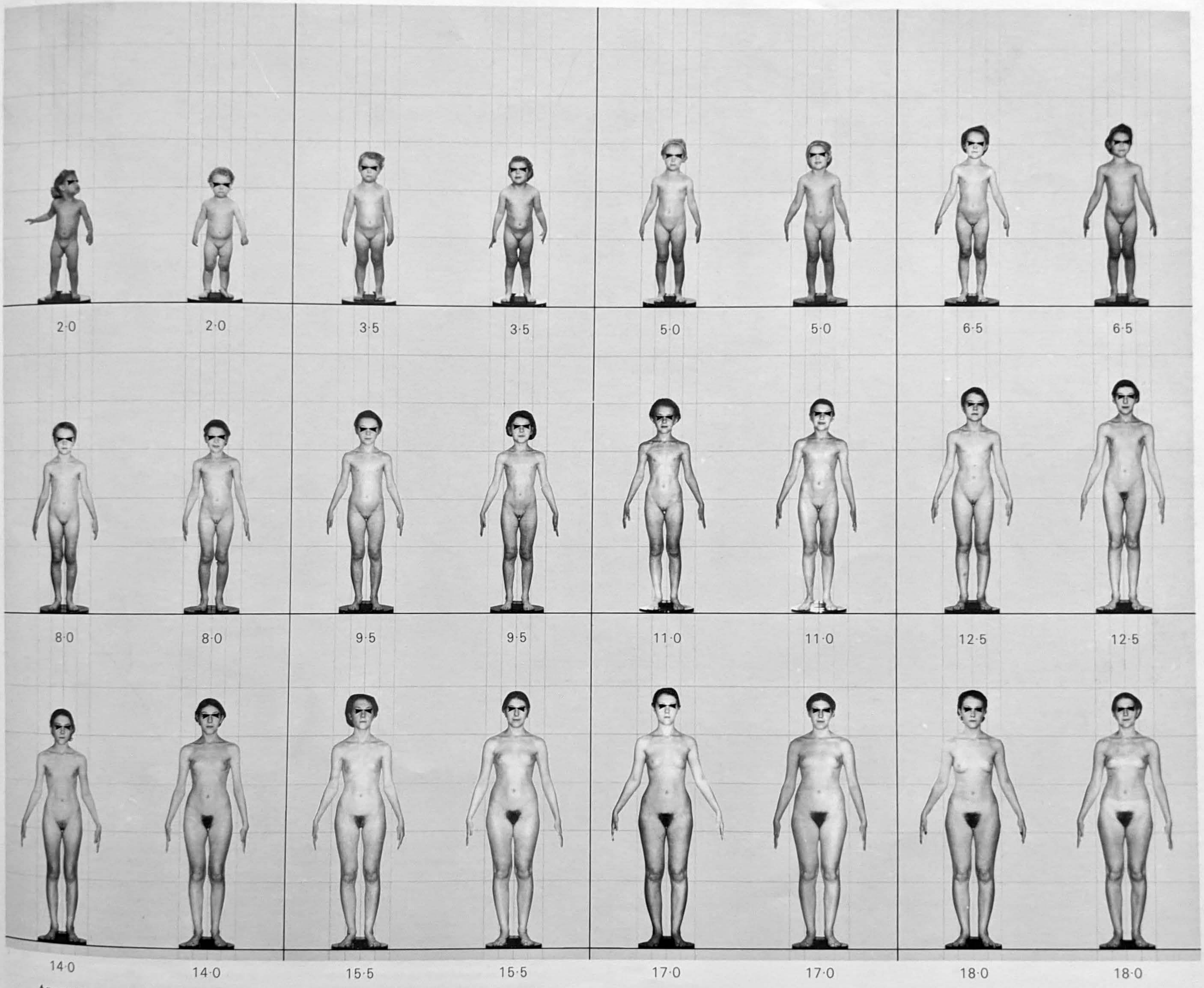
Fig. 8. □ subject no. 64; ● subject no. 65.

Non-identical Twins

Subjects Nos 64 and 65

A pair of non-identical twins, subjects 64 and 65, who differ genetically as much as sisters. Subject no. 65 weighed 2300 g at birth and subject no. 64, 2270 g. They were virtually the same height until puberty, but then a large difference appeared and when no. 65 reached menarche at age 13·5 she was 8 cm taller than no. 64, who reached menarche only at 14·9 years. At age 17 however, no. 64 had caught up in height and was finally about 1 cm taller. These twins, then, are a classical example of the family dynamics of growth, with one child a late developer, who falls behind but eventually overtakes her sister. There were two periods when both twins suffered a distinct fall-off in height velocity followed by a catch-up. The first, between ages 2·5 and 3·5, coincided with the birth and infancy of a younger sister and is well seen in the standard whole-year velocity chart (Fig. 2). The second was from13·0 to 13·5 when their mother had a fairly severe illness and their diet consequently changed. Since this period was short-lived it is not seen in whole-year velocities and so 6-monthly velocities have been plotted in the inset section of the chart. After each fall in velocity there was a period of catch-up. In terms of annual increment the peak height velocity of no. 65 was at exactly average age, and at exactly the 50th centile level; that of no. 64 was 2 SD late, but also at the 50th centile level.

In both twins, sitting height and leg length (Fig. 3) follow similar curves to height (Fig. 1). However, no. 64 is slightly greater in sitting height before puberty and her finally greater height is due entirely to a sitting height difference. In biacromial diameter (Fig. 7) no. 65 remains larger at maturity, while in biiliac diameter (Fig. 8) she is initially smaller and ends approximately the same. No. 65 is fatter throughout; her triceps skinfold (Fig. 5) shows a marked drop during the height spurt. No. 64 also drops during her spurt 18 months later, but not to the same degree. In bone maturity score (Fig. 6) the twins are similar till age 12, when the score for no. 65 increases rapidly from the 15th to the 50th, while that for no. 64 falls through the 10th to eventually below the 3rd, in line with her very late puberty.



At each age, subject no. 64 is on the left; subject no. 65 on the right.

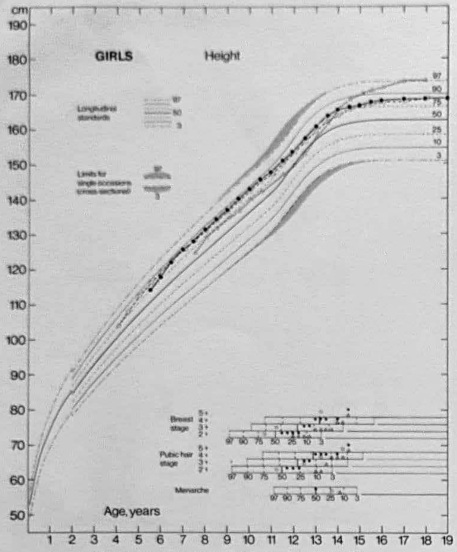


Fig. 1. ○ subject no. 36; △ no. 66; ● no. 67.

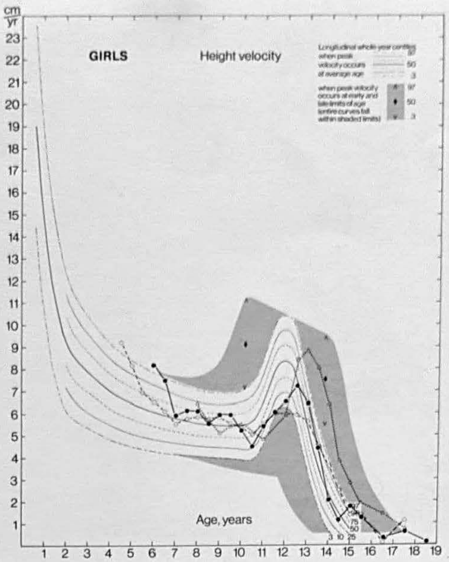


Fig. 2. ○ subject no. 36; △ no. 66; ● no. 67.

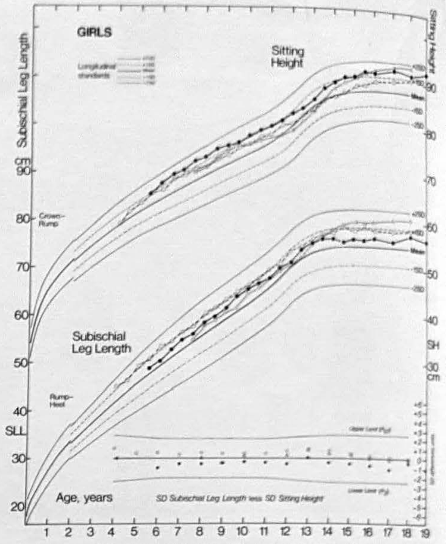


Fig. 3. ○ subject no. 36; △ no. 66; ● no. 67.

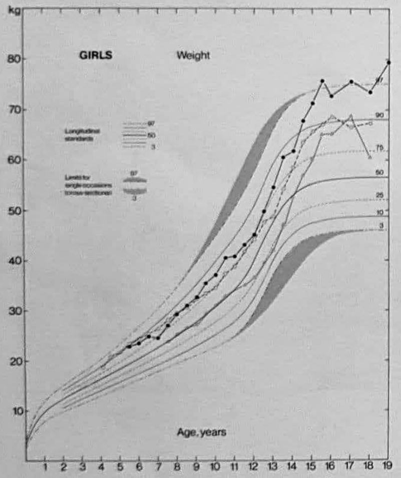


Fig. 4. ○ subject no. 36; △ no. 66; ● no. 67.

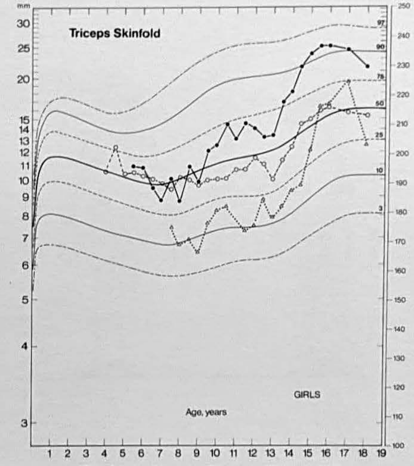


Fig. 5. ○ subject no. 36; △ no. 66; ● no. 67.

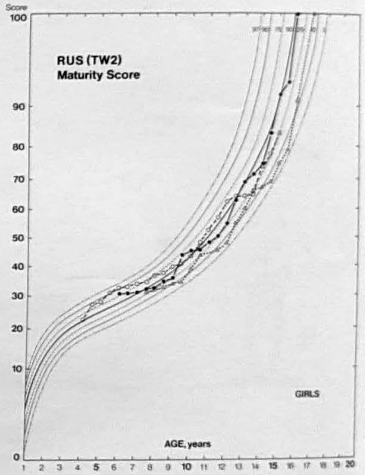


Fig. 6. ○ subject no. 36; △ no. 66; ● no. 67.

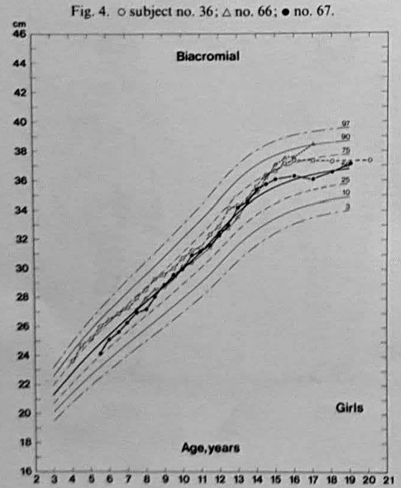


Fig. 7. ○ subject no. 36; △ no. 66; ● no. 67.

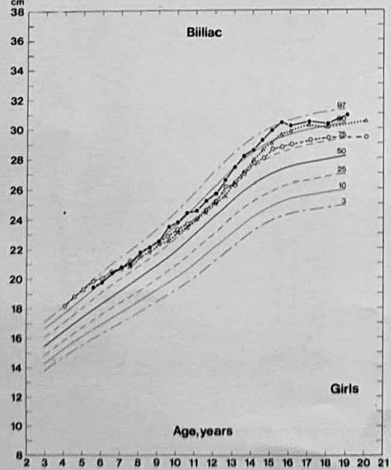


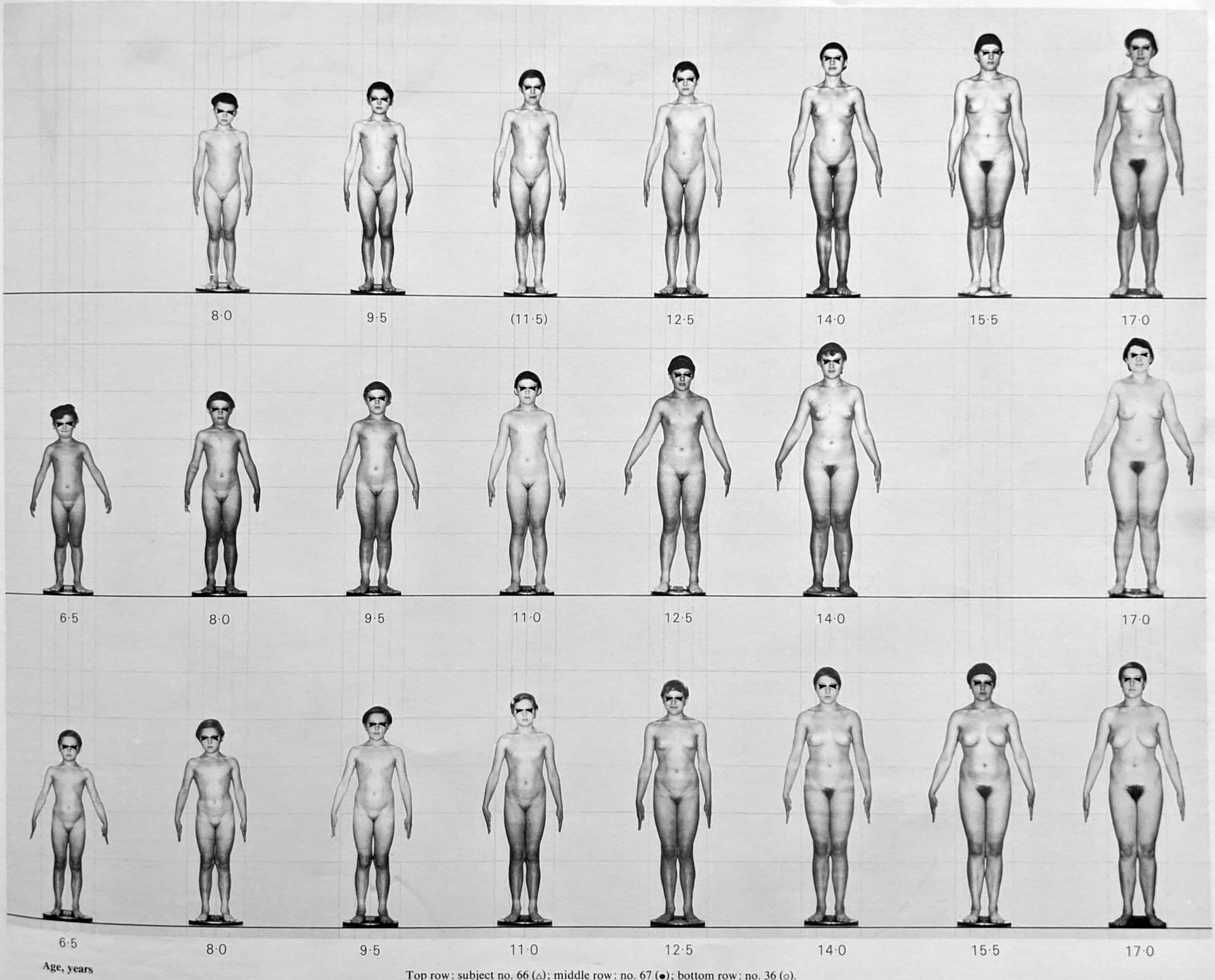
Fig. 8. ○ subject no. 36; △ no. 66; ● no. 67.

Siblings (Girls) *Subjects Nos 66, 67 and 36*

Subjects 66, 67 and 36 are all sisters of the pair of monozygotic twins (nos 45 and 61) presented on p. 128. No. 66, the oldest, has a much greater adolescent spurt in height than nos 67 and 36, who resemble each other closely in height growth. The three height velocity curves, incidently, show a relationship between the age of peak velocity and the level reached at peak, which is the reverse of that usually found in a population. In this family, the sister with the latest spurt has the highest peak. The greater height spurt of no. 66 is about equally compounded of sitting height and leg length, in both of which she goes from being the smallest to the largest. From age 10 onwards nos 66 and 36 have very similar proportions of trunk and legs, while no. 67 has distinctly shorter legs.

Considerable differences in shape between the sisters can be inferred simply from the measurement charts. Triceps skinfold, weight and biiliac diameter are always greatest in no. 67; no. 66 is least in triceps skinfold and weight, but intermediate in biiliac diameter. In biacromial diameter all three lie between the 25th and 75th centiles and all end between the 60th and 70th. In bone maturity score all are most of the time between the 10th and 75th centiles. At age 12 the earliest to spurt is at the 60th centile for timing, the middle to spurt at the 25th for timing and the last to spurt is at the 5th.

In breast development, no. 36 is earliest and no. 66 last with no. 67 intermediate. In pubic hair there is little difference between nos 36 and 67, and no. 67 has her menarche earlier. No. 66 has a more rapid transit through the breast and pubic hair stages than the others, in line with her larger height spurt. The pictures show considerable similarities in physique, particularly as regards the knock knees. No. 66 is a little more mesomorphic than the other two subjects, however, and no. 67 is more endomorphic.



Top row: subject no. 66 (△); middle row: no. 67 (●); bottom row: no. 36 (○).

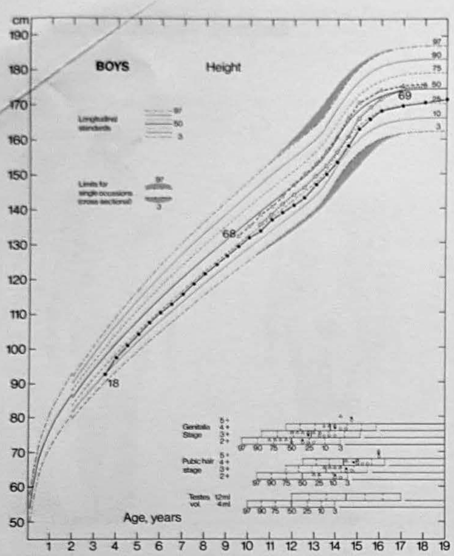


Fig. 1. ● subject no. 18; △ no. 68; ○ no. 69.

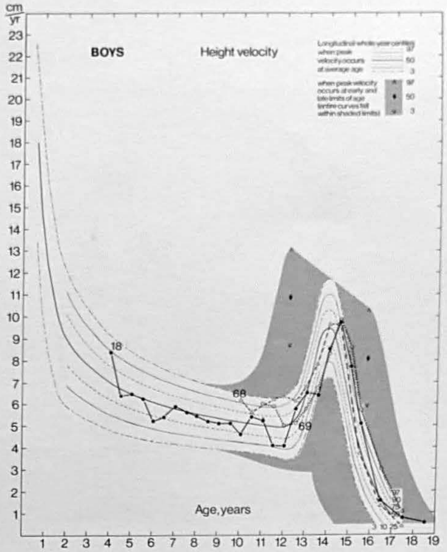


Fig. 2. ● subject no. 18; △ no. 68; ○ no. 69.

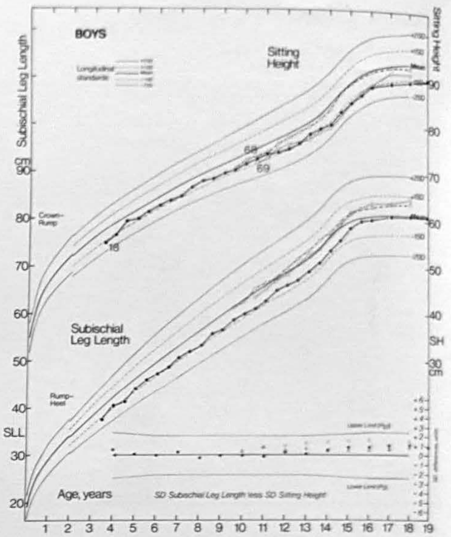


Fig. 3. ● subject no. 18; △ no. 68; ○ no. 69.

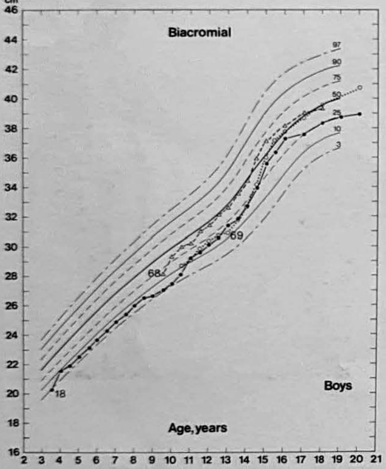


Fig. 4. ● subject no. 18; △ no. 68; ○ no. 69.

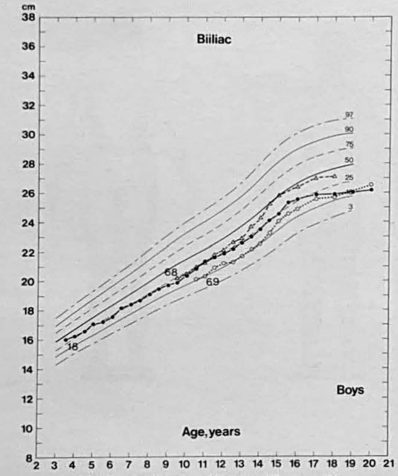


Fig. 5. ● subject no. 18; △ no. 68; ○ no. 69.

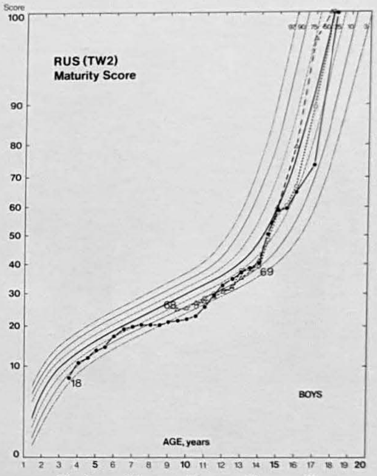


Fig. 6. ● subject no. 18; △ no. 68; ○ no. 69.

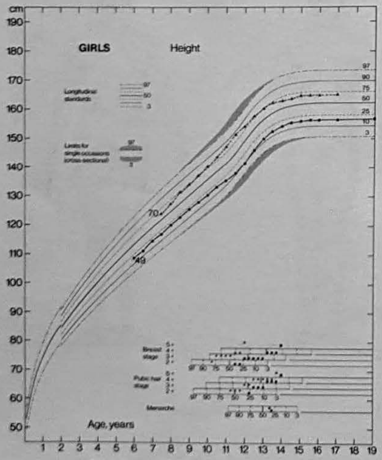


Fig. 7. ▲ subject no. 70; ■ no. 49.

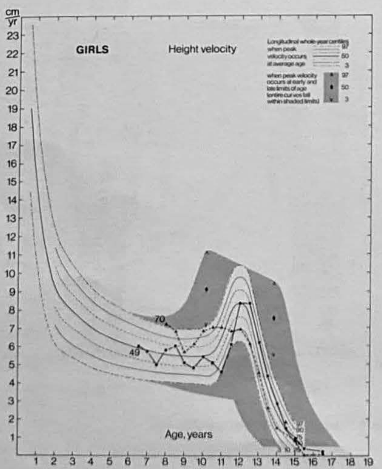


Fig. 8. ▲ subject no. 70; ■ no. 49.

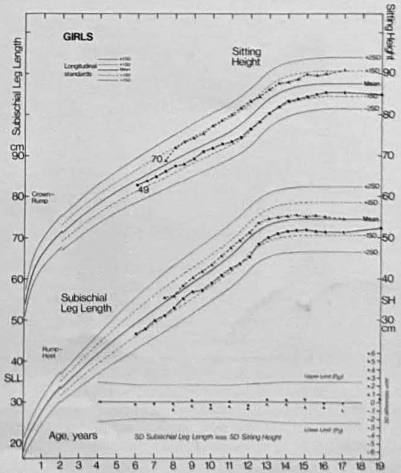


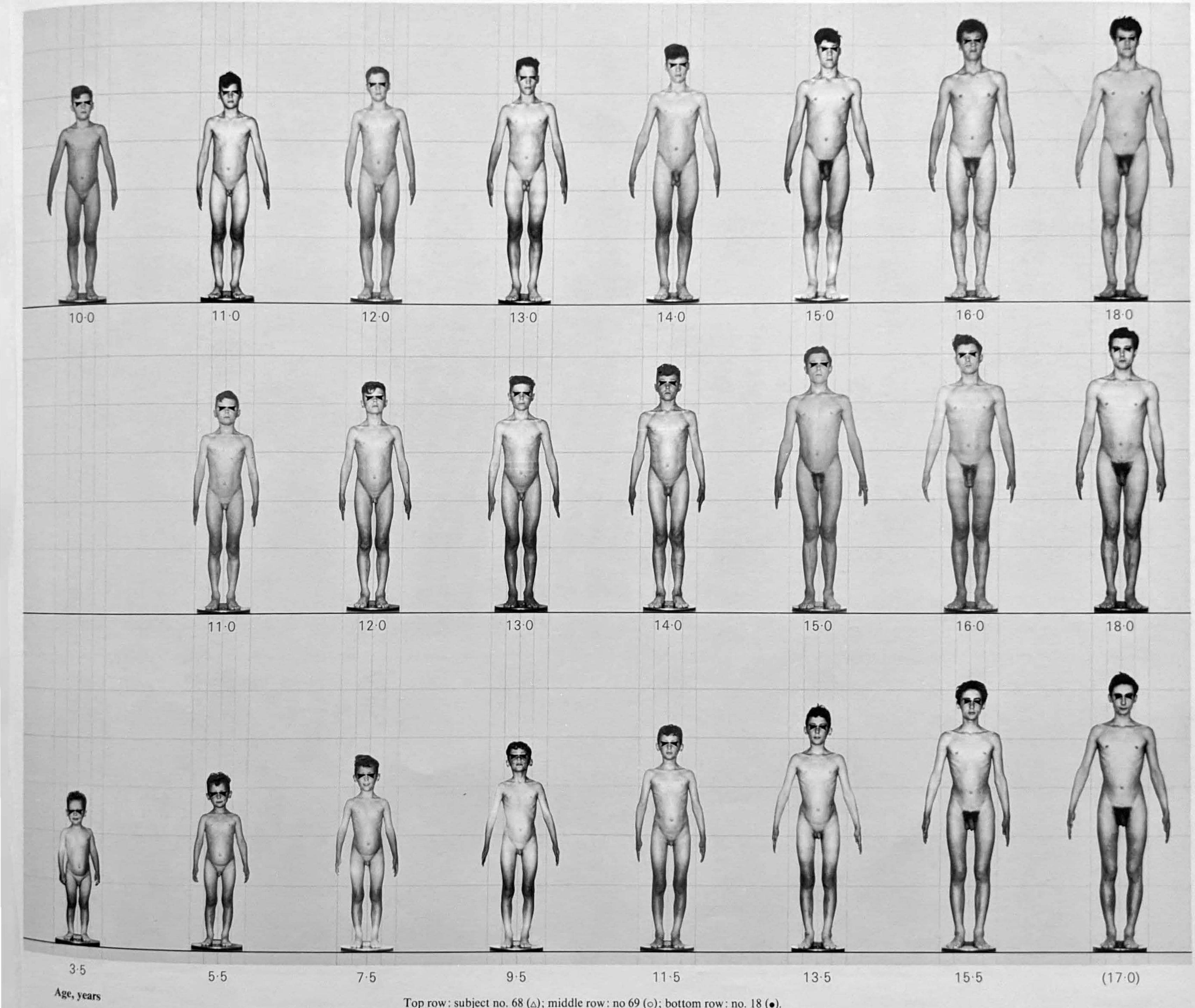
Fig. 9. ▲ subject no. 70; ■ no. 49.

Siblings *Subjects Nos 68, 69 and 18 (Boys)* *49 and 70 (Girls)*

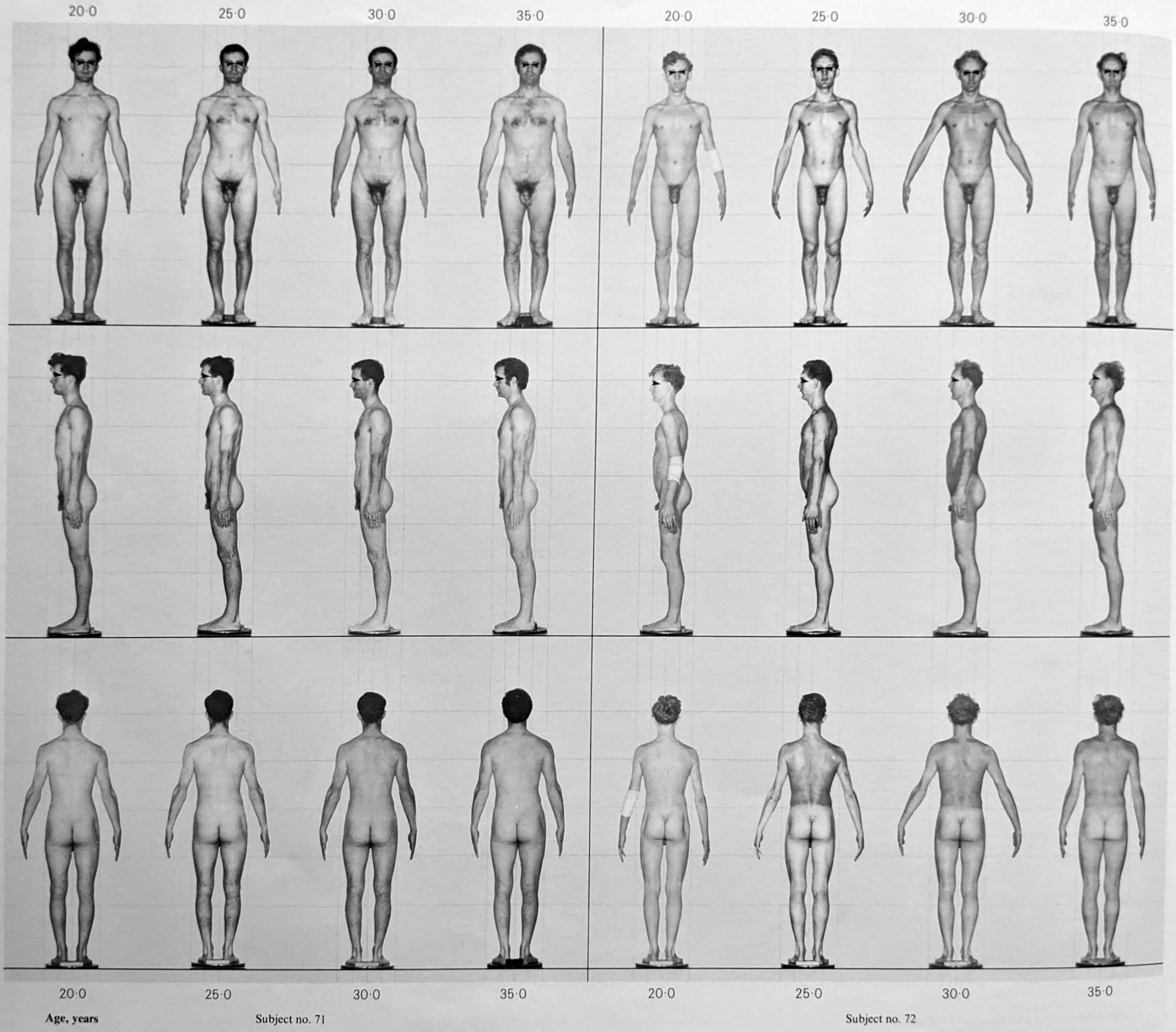
Three brothers, subjects nos 68, 69 and 18, are shown in the photographs (p. 135) and charts (this page), and their two sisters, subjects nos 49 and 70, in charts only (this page).

The brothers have height curves that are similar in shape (Fig. 1). The oldest, no. 68, is slightly taller throughout childhood, but no. 69 catches him up at 18, because of a more prolonged height spurt. All have slightly longer than average legs for their sitting heights (Fig. 3) with final SD differences of between 1·0 and 1·5. No. 68 has the greatest sitting height throughout. At maturity all have greater biacromial than biiliac diameters (Figs 4 and 5); in no. 69 the difference is considerably more marked, however, than in no. 18. In skeletal maturity, as in age of peak height velocity, all three are closely similar until late in adolescence (Fig. 6). They are less alike in genitalia and pubic hair timing; here no. 68 is clearly earliest and no. 69 latest. The pictures show a considerable similarity of physique, with no. 69 slightly more endomorphic than the other two.

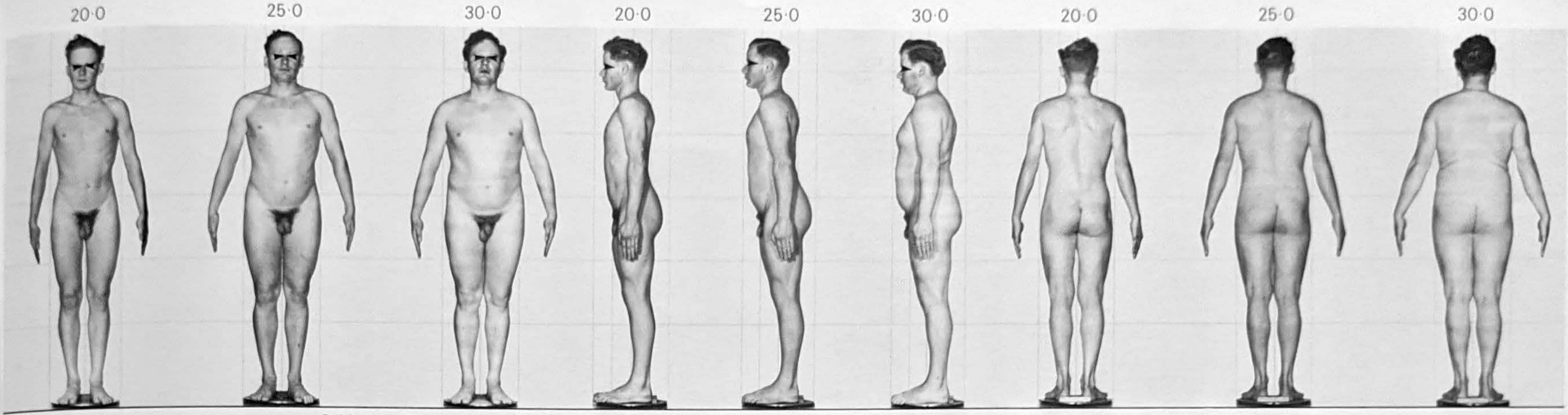
The sisters are the third and fourth of the sibship of five. The older sister, no. 70, was the taller at all ages and had an early and very low-peaked height spurt. The smaller sister's height spurt is a near average one. In proportions of trunk and legs, the smaller sister is also near average, while no. 70's legs are distinctly shorter.



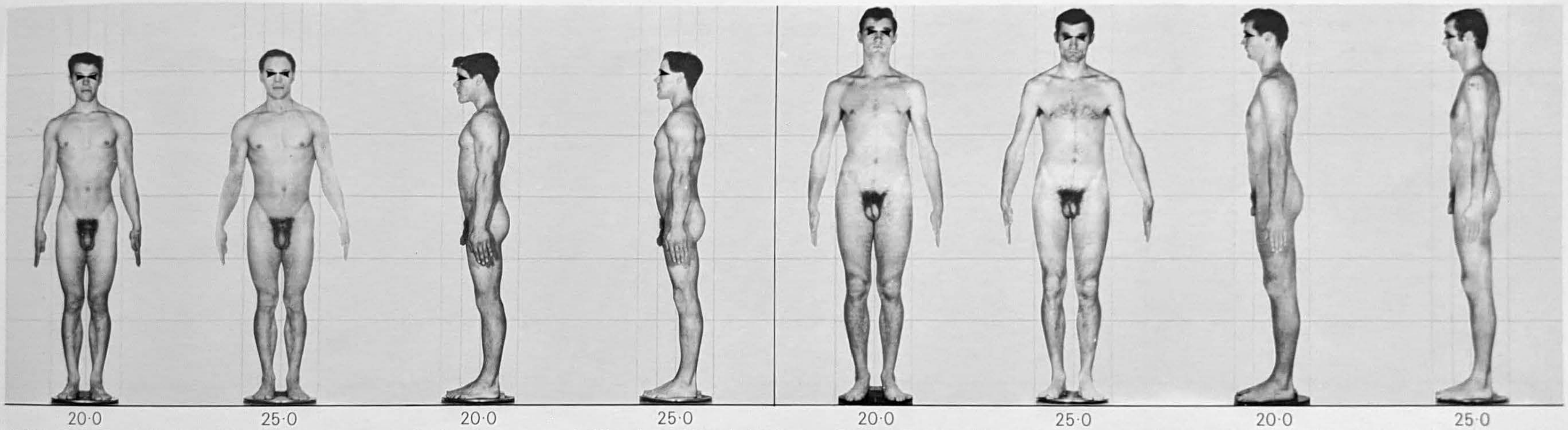
Top row: subject no. 68 (△); middle row: no 69 (○); bottom row: no. 18 (●).



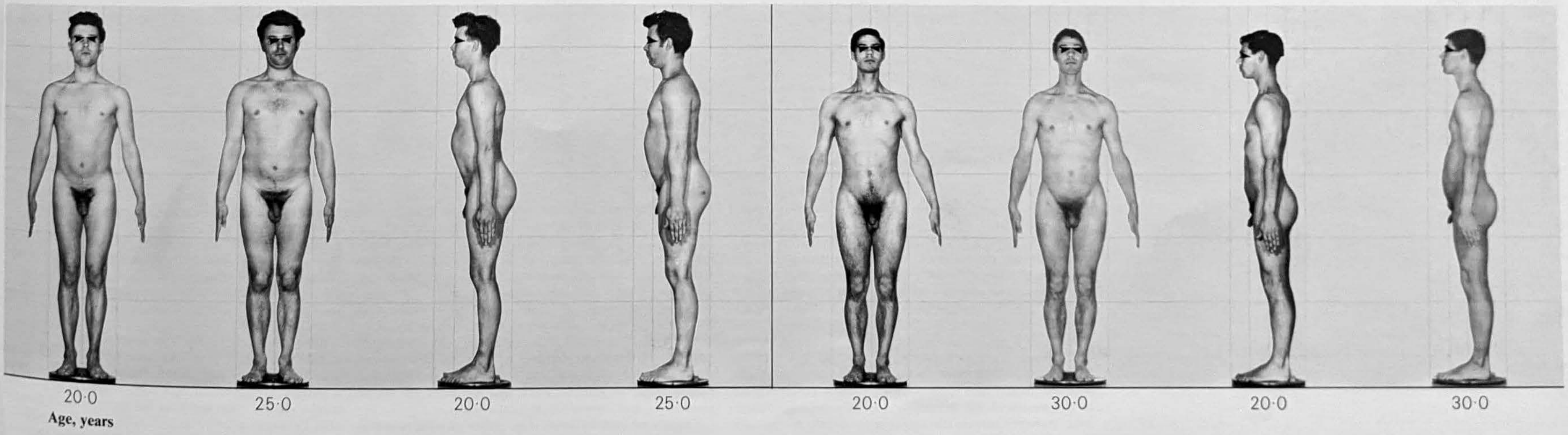
A few subjects were remeasured at 25, 30, and 35 years. Both subjects shown here are fairly central in somatotype; 71, a business manager, is more mesomorphic and less endomorphic than 72, a steel erector. Number 71 gained only 3·7 kg from 20–35 and his height did not change; no. 72 gained 8·2 kg and 1·0 cm in height. Biacromial diameter increased 0·6 cm in both.



Subject no. 73, a non-manual worker, followed from 20 to 30, has a somatotype 44½2, moderately central but substantial in endomorphy.



Subjects 74 (left) and 75 (right) are both high in mesomorphy. Subject 74, a carpenter, is 263 and grew 0·7 cm in height over this 20 to 25 period. Subject 75, an insurance broker, is more ectomorphic at 254; his height did not change.



Subject no. 76 (left) is relatively endomorphic, somatotype 4½3½2½. He gained 10·5 kg from 20 to 25, despite a manual job. Subject 77 (right) is of rather central somatotype (343½). From 20 to 30 he lost weight (1·6 kg) and did not change in height, but his latent endomorphy is beginning to produce its effect at 30 and control of food intake is necessary, in a way which would never occur in no. 75.

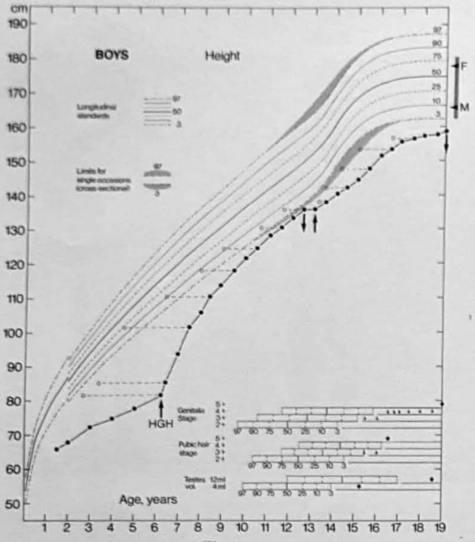


Fig. 1.

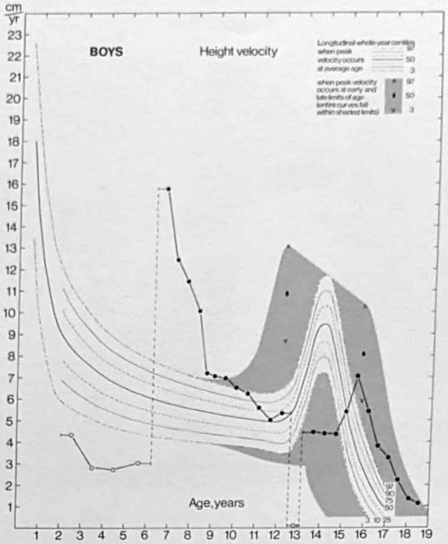


Fig. 2.

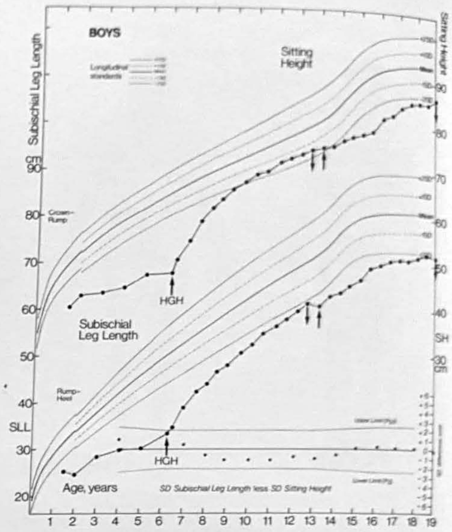


Fig. 3.

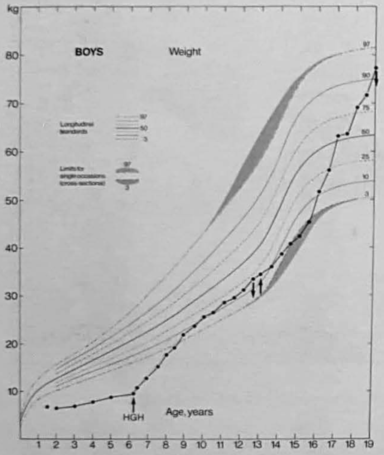


Fig. 4.

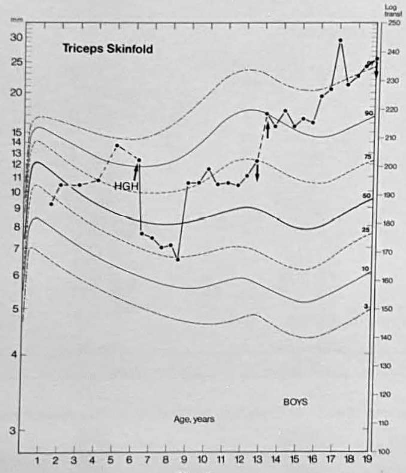


Fig. 5.

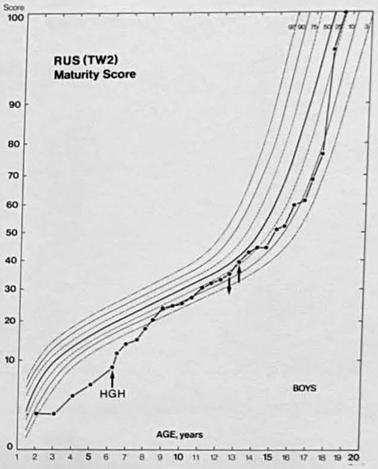


Fig. 6.

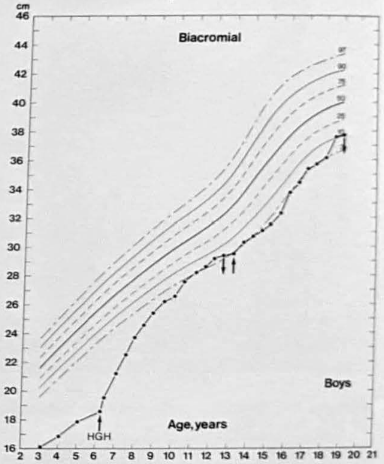


Fig. 7.

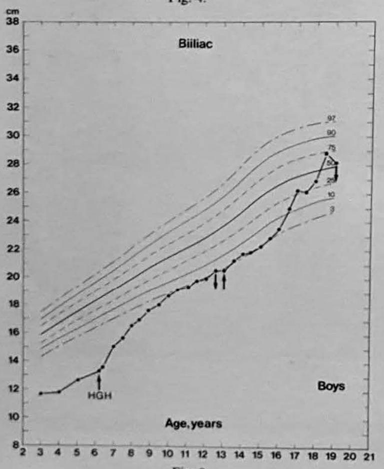


Fig. 8.

True Isolated Growth Hormone Deficiency

Subject No. 78

This subject is the elder of two brothers with true isolated growth hormone deficiency. The remainder of the sibship consists of three normal boys, and the parents are unrelated and of normal stature. He was born following a normal pregnancy and labour, birth weight 2750 g (−1·3 SD, allowing for mother's height). No treatment was possible until he was aged 6·2 years, since it was only then that Human Growth Hormone (HGH) became available. From then till age 19·0, except for the period from 12·5 to 13·0 years, he received HGH twice weekly by intramuscular injection, mostly in a dosage of 20 IU/week. The height centiles of the father (65th) and mother (10th) are shown with the "target" area within which their sons' heights should lie 95 times out of 100. Our subject just fails to reach this target area, probably because his height was initially so low. His younger brother, who began treatment at 2·1 years, rose rapidly to the 10th centile for height and will end at approximately the same centile as his mother (Tanner, 1976).

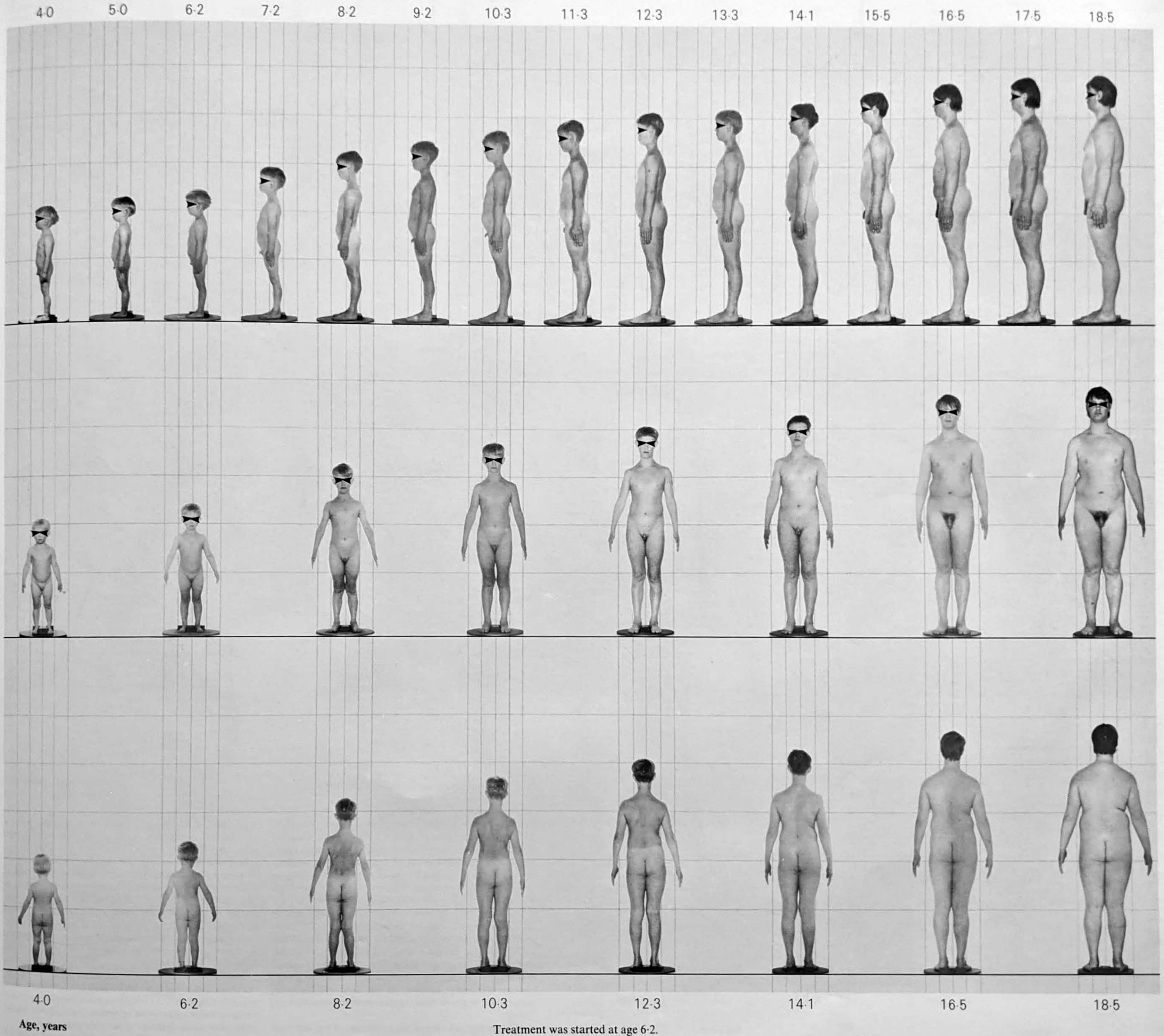
The height curve (Fig. 1) shows a good catch-up on treatment and no growth during the 6 months off treatment. The open circles represent height plotted against bone age. Thus delay in bone age is measured by the length of each horizontal line; it is 3·5 years at the beginning of treatment, and 0·8 years when catch-up is essentially completed, at 11 to 12 years. Height velocity (Fig. 2) shows the detail of the catch-up. There is a very high initial velocity (equivalent to the average rate of a 1-year-old infant) which decreases to reach the 50th centile after 5 years of treatment. The adolescent growth spurt is late, as is usual in these patients (Tanner and Whitehouse, 1975). The peak height velocity only reaches the 20th centile but this is a familial characteristic shown also by two of his normal brothers. The puberty stages of genitalia, pubic hair and testis size are all reached very late, beyond the 3rd centile limits.

Sitting height and leg length (Fig. 3) show an equal reduction of legs and trunk before treatment, followed by a relatively swifter catch-up in sitting height, which is within normal limits after 3 years. This is a question of the tortoise and the hare, however, for leg length continues slowly to gain and in the end is nearer the −2 SD line than is sitting height (except for sitting height at 19, clearly a product only of increasing obesity).

Weight (Fig. 4) catches up to the 20th centile and then at puberty rises to unfortunate levels. Triceps skinfold (Fig. 5) decreases sharply when treatment starts, as it invariably does (Tanner and Whitehouse, 1967), but rises after 2 years of treatment to the 75th centile and increases sharply again during the 6 months off treatment. Thereafter it rises gradually to the 97th centile.

Bone maturity score (Fig. 6) is very low before treatment, as is usual, and on treatment catches up, reaching the 25th centile after 3 years. It then remains between the 20th and 25th centiles, a position corresponding approximately to the age of peak height velocity (10th centile in timing). Biacromial diameter (Fig. 7) catches up to the 10th and biiliac (Fig. 8) to the 50th.

The first three pictures (side view, p. 139) represent the period of 2 years before treatment. The treatment catch-up is well shown, as is the late adolescent growth spurt, between 14 and 16 years. The endomorphic physique is clearly implicit from the earliest pictures.



Treatment was started at age 6·2.

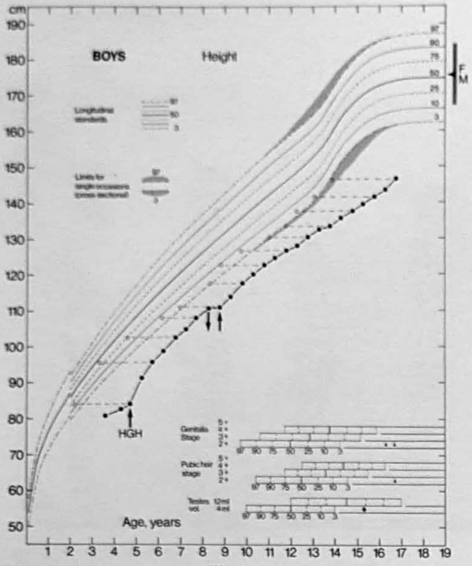


Fig. 1.

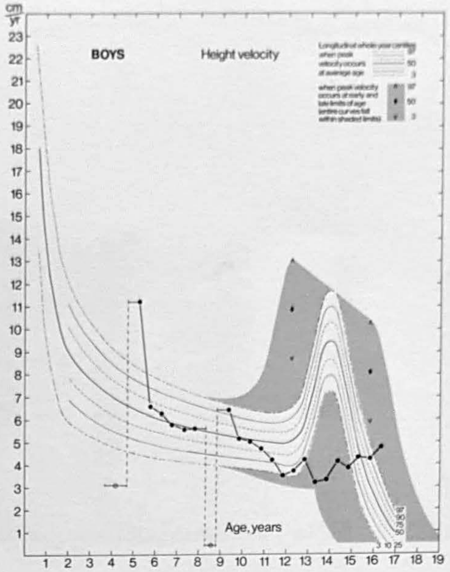


Fig. 2.

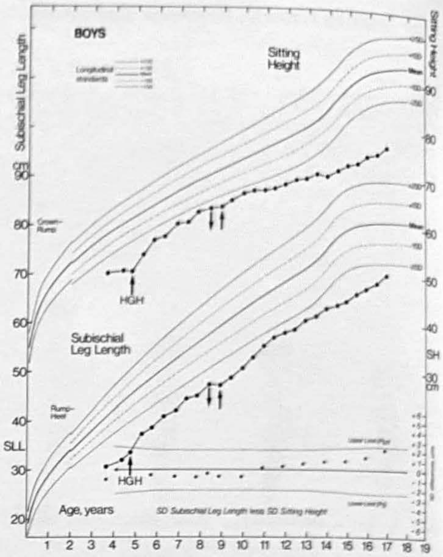


Fig. 3.

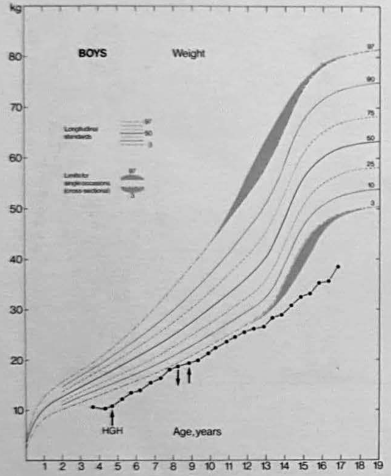


Fig. 4.

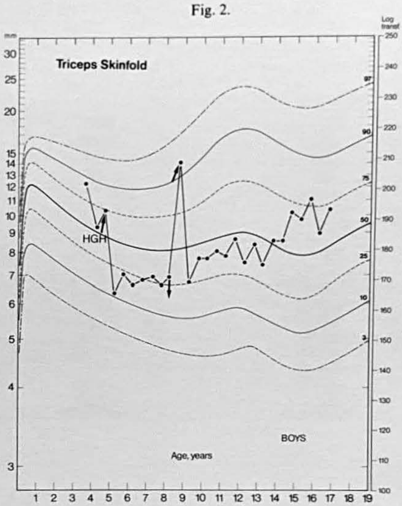


Fig. 5.

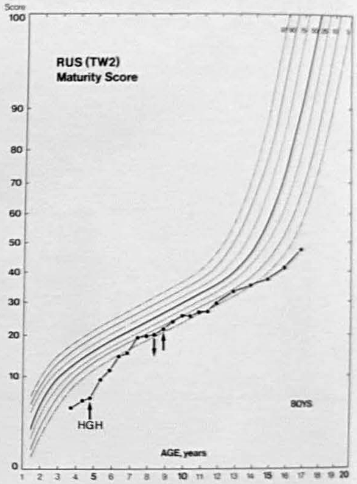


Fig. 6.

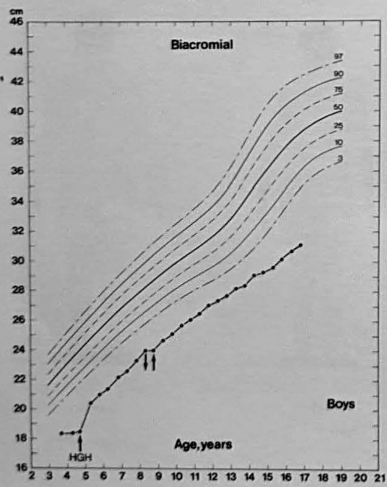


Fig. 7.

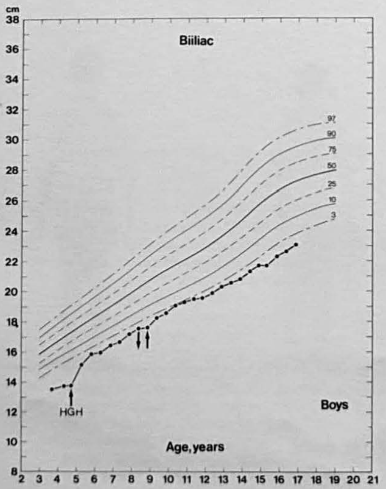


Fig. 8.

True Isolated Growth Hormone Deficiency

Subject No. 79

This subject also has true isolated growth hormone deficiency, but this time there is no family history of the disorder. Birthweight was 4100 g, pregnancy and labour normal. Treatment with HGH started at age 4·8. In this subject the catch-up velocity lasts only 1 year; thereafter height velocity (Fig. 2) remains at the 50th centile till 10·5 (apart from the 6 months off treatment which was followed by a minor catch-up). After this the velocity falls to the 3rd centile despite treatment. Puberty began spontaneously, with left testis size 4 ml at age 15·3 (right is undescended) and is under way at the time of writing. It seems unlikely that this subject will reach a final height within the target area; his last prediction of adult height was 162 cm, which is exactly 3rd centile. Height predictions are invalid in growth hormone deficiency, however, in the sense that treatment progressively improves them; his pre-treatment prediction was 150 cm.

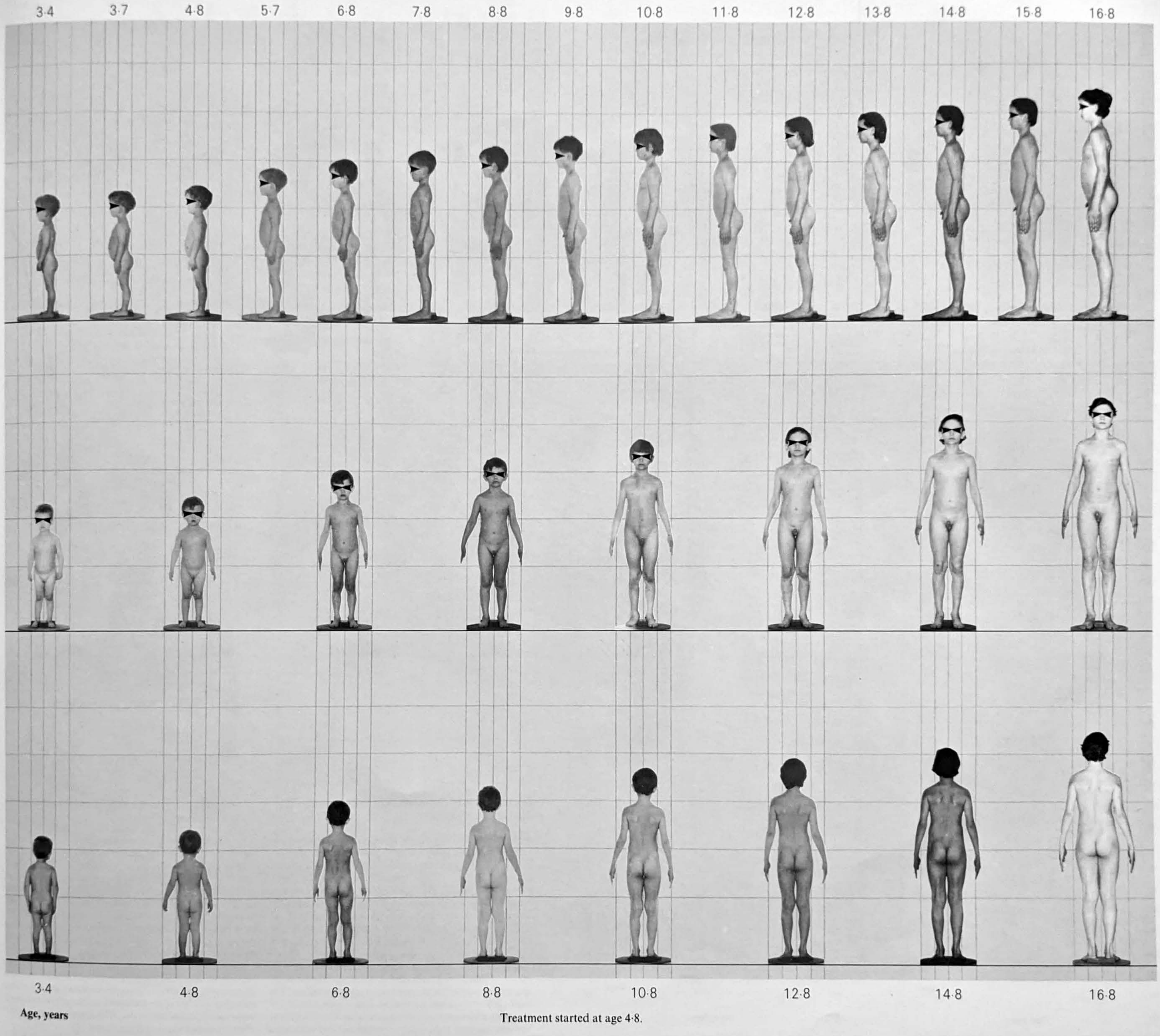
As in the previous subject, the proportions of legs and trunk are normal, with both equally diminished before treatment. The legs grow faster than the trunk from age 10 onwards, and when puberty starts, the difference between the SD scores has reached +1·4. However, the greater sitting height increment at puberty will probably result in a return to approximately average proportions (Fig. 3).

Biacromial diameter (Fig. 7) is initially very low and shows the same pattern of catch-up as height. Biiliac diameter (Fig. 8) is less depressed at the beginning of treatment and catches up to very near the 3rd centile. The triceps skinfold (Fig. 5) falls sharply on treatment and increases equally sharply when treatment is discontinued, which it was from 8·3 to 8·8 years. This explains why weight, unlike height, continues to rise during the 6 months off treatment. Skinfolds gradually increase before puberty.

Skeletal maturity (Fig. 6) is below the 3rd centile before treatment, rises to the 25th after 2·5 years of treatment and then gradually falls back to the 3rd. The delays in bone age and in sex character development are in agreement; testis size 4 ml begins at the quite normal bone age of about 13 "years".

The pictures on page 141 show the lack of growth in the 1·4 years before treatment and the marked catch-up in the first interval after treatment starts.

Subject No. 79



Treatment started at age 4·8.

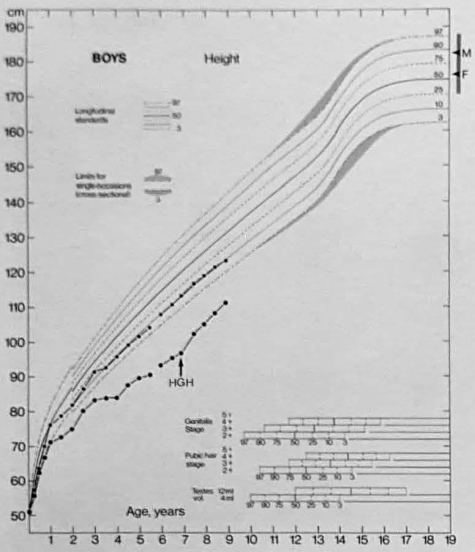


Fig. 1. ● subject no. 80; ■ no. 81.

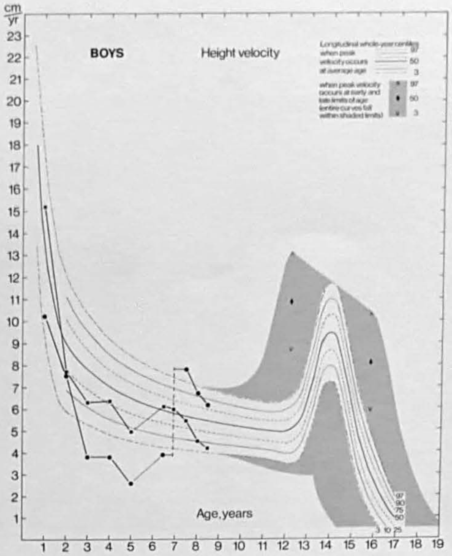


Fig. 2. ● subject no. 80; ■ no. 81.

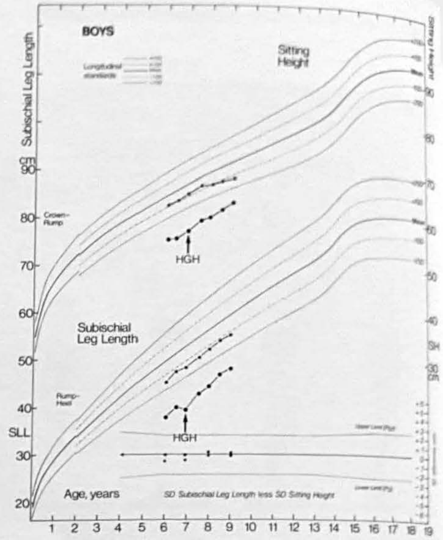


Fig. 3. ● subject no. 80; ■ no. 81.

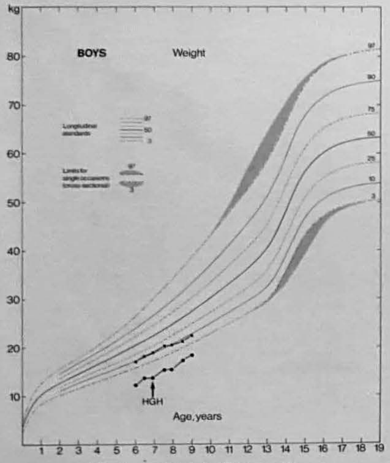


Fig. 4. ● subject no. 80; ■ no. 81.

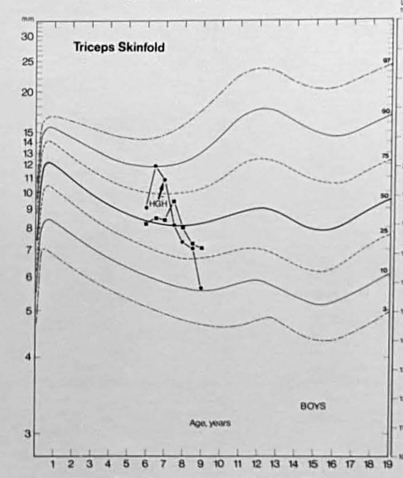


Fig. 5. ● subject no. 80; ■ no. 81.

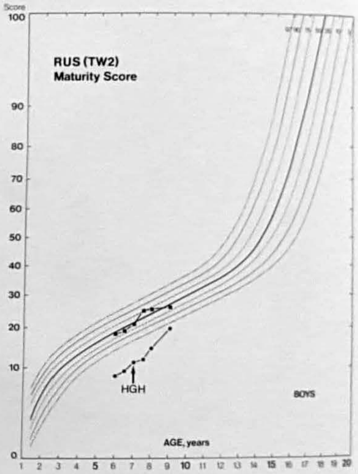


Fig. 6. ● subject no. 80; ■ no. 81.

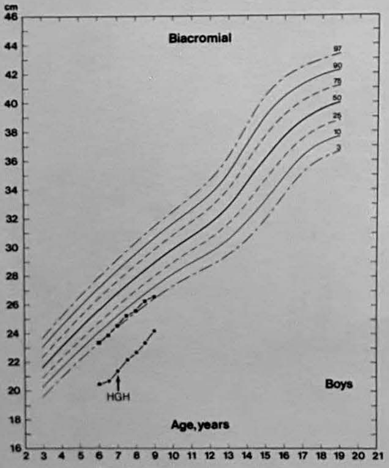


Fig. 7. ● subject no. 80; ■ no. 81.

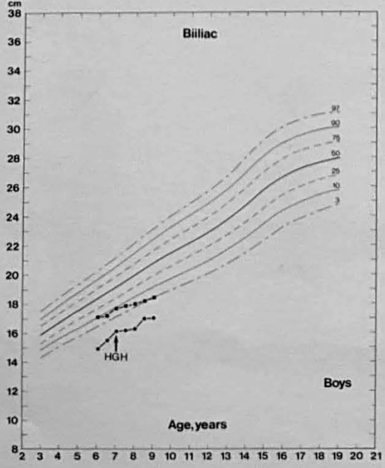


Fig. 8. ● subject no. 80; ■ no. 81.

Isolated Growth Hormone Deficiency in One of Two Monozygotic Twins

Subjects Nos 80 and 81

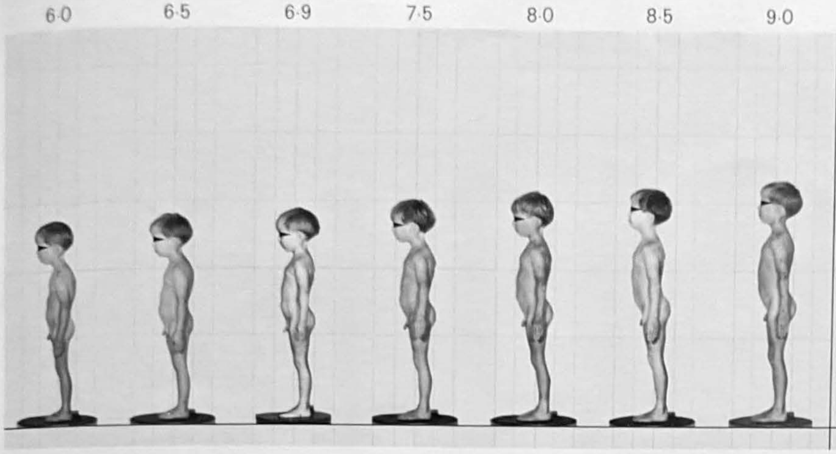
A pair of monozygotic twins, of whom one has isolated growth hormone deficiency. Birth was by Caesarian section at 38 weeks after a threatened abortion. The weight of the affected twin, no. 80, was 3150 g and of the unaffected twin, 3030 g. The twins were first seen in the Growth Disorder Clinic at age 6·0 but had been measured by their parents since birth (simply because they were twins). In the height chart (Fig. 1) the two sets of measurements are separated by gaps in the curves. In the height velocity chart (Fig. 2) the velocity which includes change of technique and measurers follows the thin line.

The twins differ in height velocity right from birth, and by 18 months it should have been clear to the physicians consulted that they were dealing with some form of growth pathology. The unaffected twin's height stays at the 10th centile most of the time, with height velocity averaging about the 25th. The growth hormone deficient twin has a low height velocity from birth onwards. On treatment he shows a catch-up, though not a very dramatic one.

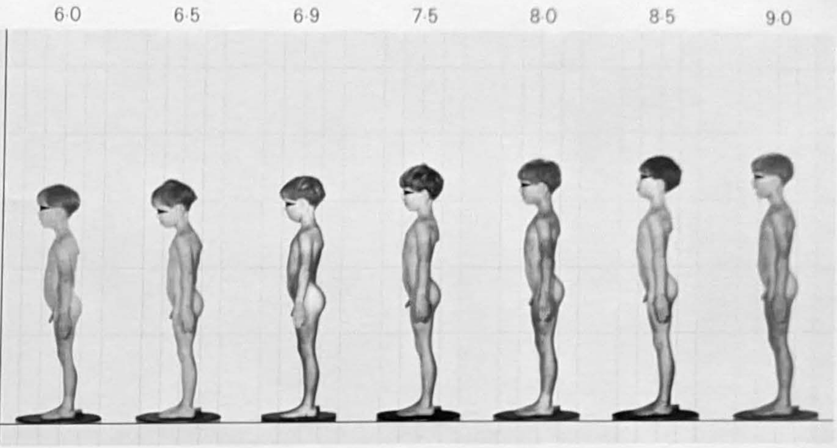
The unaffected twin is about −1 SD in both sitting height and leg length (Fig. 3) and the affected twin is well below −2 SD, with both measurements proportionately reduced. Catch-up is greater in sitting height than leg length and, indeed, if we allow for the slight depression in the leg length curve at the beginning of treatment, there is little catch-up in leg length at all. Biacromial diameter (Fig. 7) shows a very marked difference between affected and unaffected, with a considerable catch-up on treatment. In biiliac diameter (Fig. 8) both pre-treatment difference and treatment catch-up are less.

Weight (Fig. 4) is as expected, with the unaffected twin on the 10th centile, as he is for height. Triceps skinfold is higher in the affected twin and drops sharply on treatment. Bone maturity score (Fig. 6) is just at the 50th in the unaffected twin and much below the 3rd in the affected one. After 2 years of treatment the affected twin has nearly caught up to the 3rd.

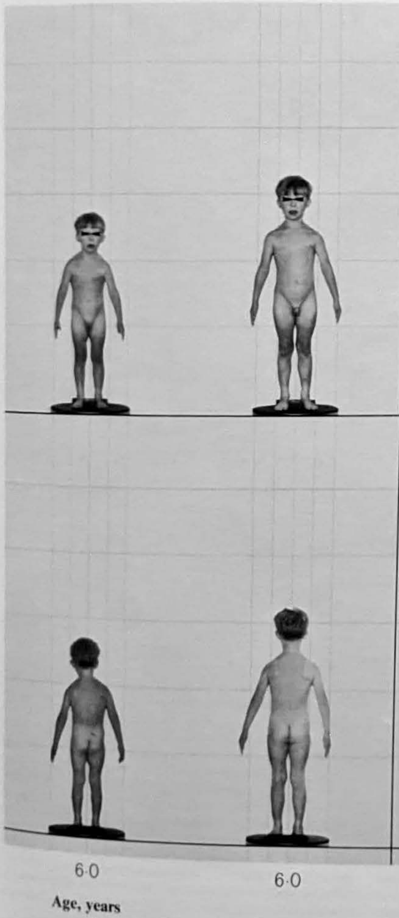
The pictures on p. 143 show the large discrepancy in size before treatment and its gradual reduction on treatment.



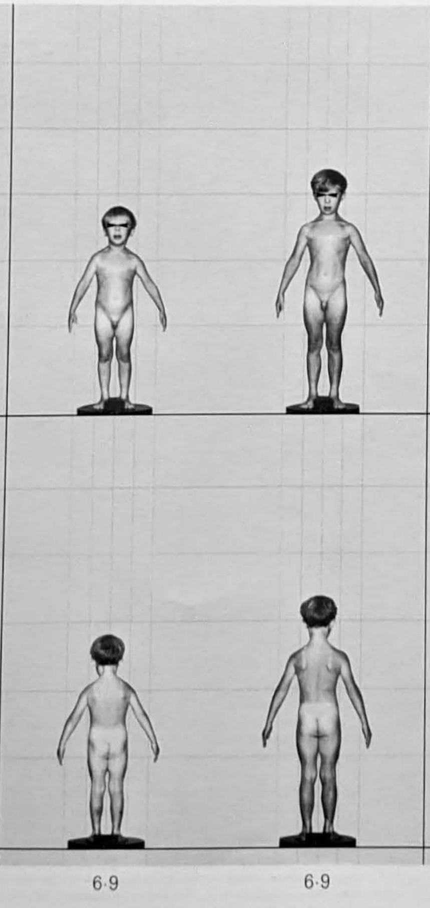
Subject no. 80. Treatment commenced at 6·9.



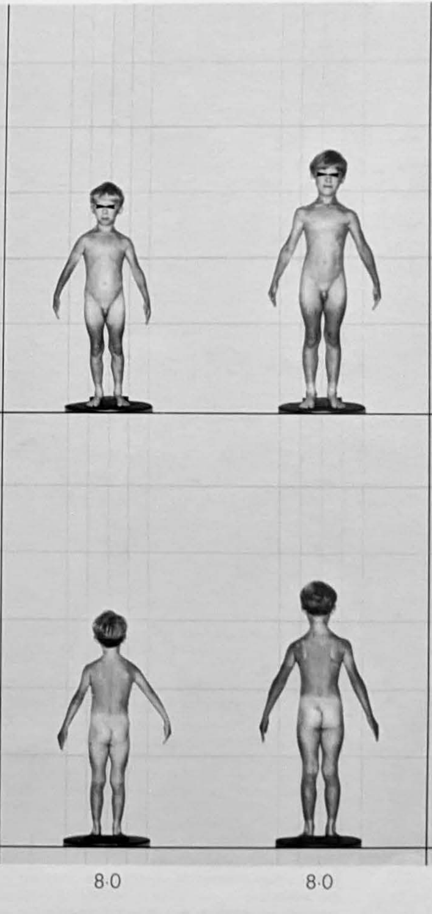
Subject no. 81.



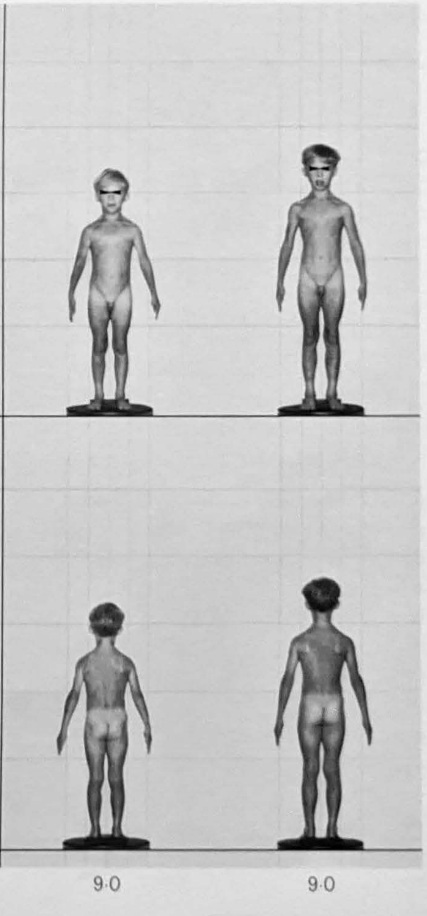
1 year before treatment.
Left no. 80, right no. 81.



Beginning of treatment.
Left no. 80, right no. 81.



1 year on treatment.
Left no. 80, right no. 81.



2 years on treatment.
Left no. 80, right no. 81.

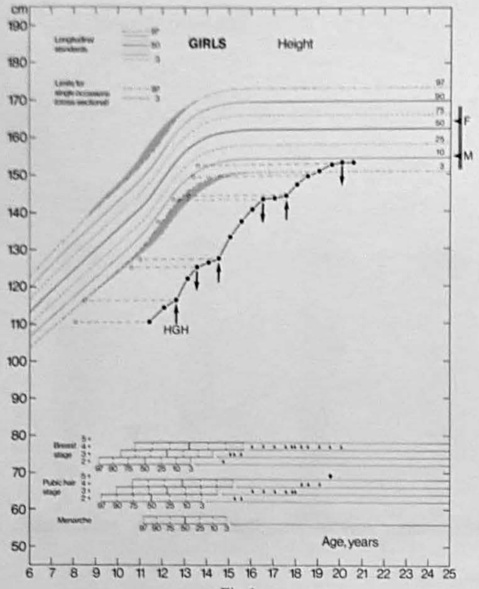


Fig. 1.

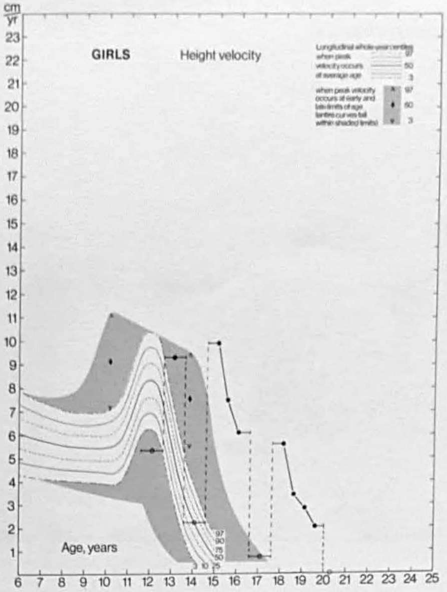


Fig. 2.

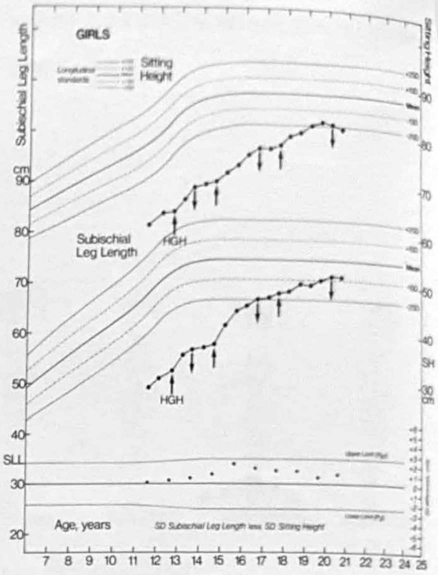


Fig. 3.

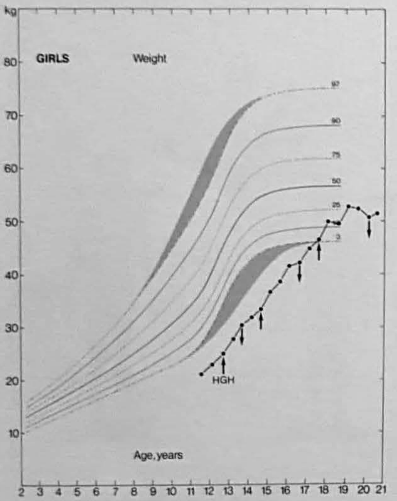


Fig. 4.

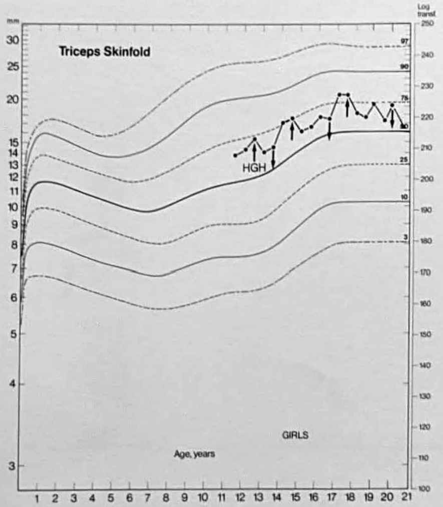


Fig. 5.

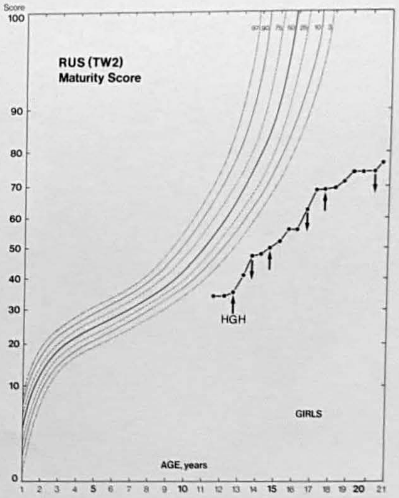


Fig. 6.

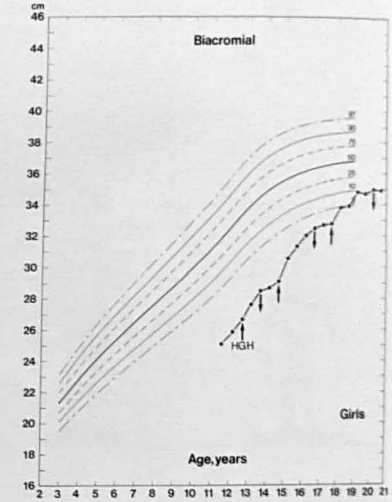


Fig. 7.

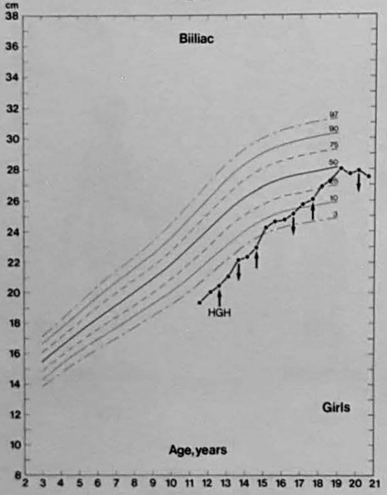


Fig. 8.

True Isolated Growth Hormone Deficiency

Subject No. 82

A girl with true isolated growth hormone deficiency, a disorder in which boys outnumber girls by 3:1, for unknown reasons (Rona and Tanner, 1977). She is a first-born child, of normal pregnancy and delivery, with a birthweight of 2980 g. The parents are unrelated and there is no family history of short stature. Treatment started at age 12·6, though bone age (open circles in the height chart, Fig. 1) was only 8·0 "years". There are two periods off treatment, from 13·5 to 14·5 and 16·5 to 17·5.

The height and height velocity charts (Figs 1 and 2) show a fairly rapid catch-up during the first period of treatment (9·3 cm/year) and a greater one (9·9 cm/year) during the second period, which, however, coincided with the expected position of the adolescent growth spurt in relation to bone age and development of breasts and pubic hair. Catch-up in the third period (5·7 cm/year) was a little above the level expected (about 4·3 cm/year) if treatment had been continuous from age 15 onwards. Final height is within the target area from parents' heights and only 2 cm below mother's height. This is despite the late start of treatment.

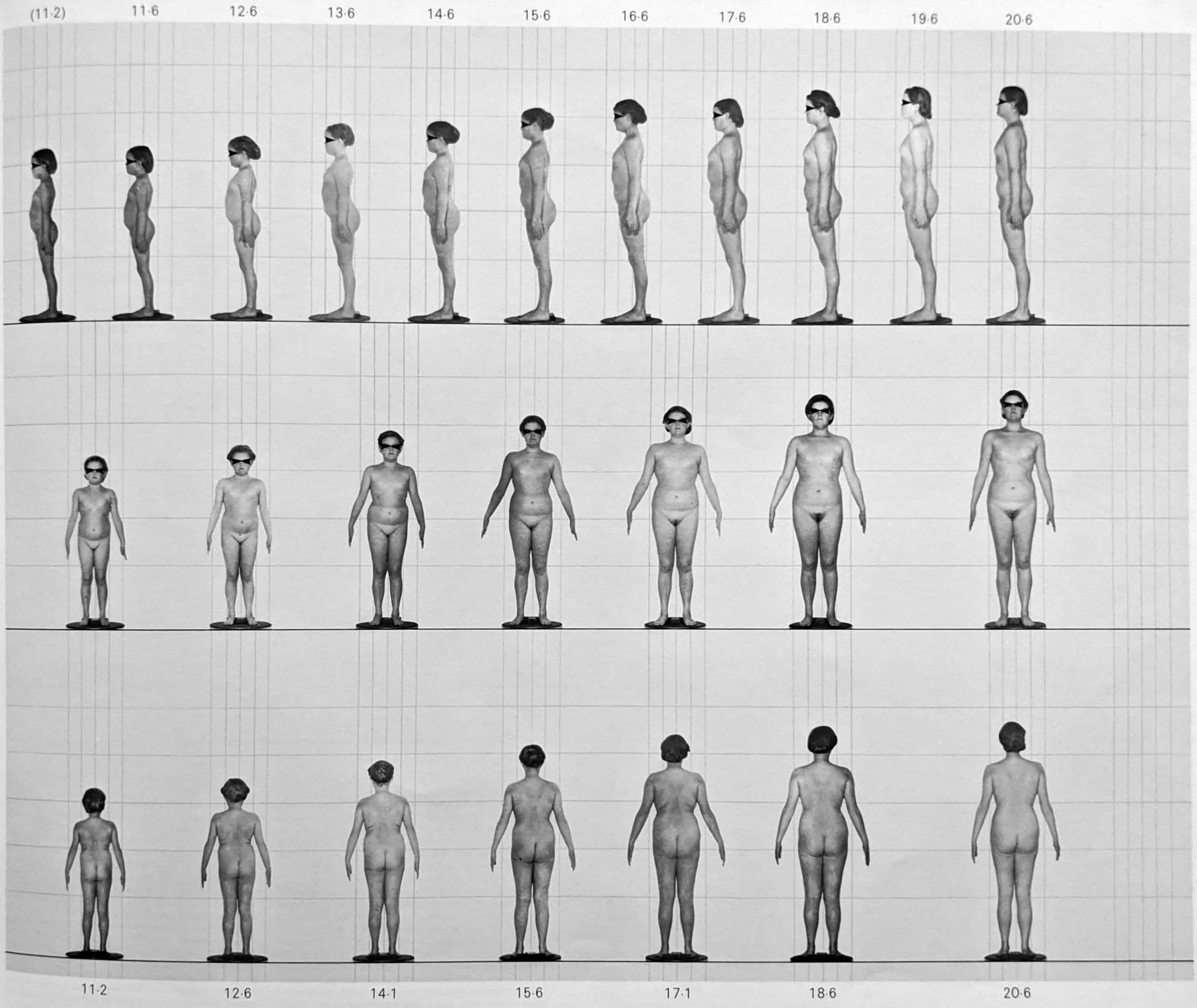
Sitting height and leg length (Fig. 3) are about equally reduced when treatment starts and they catch up at similar rates. Leg length enters the centile limits earlier than sitting height, but finally sitting height just gets to within normal limits, with the difference between the SD scores dropping to +1·0.

Biacromial (Fig. 7) diameter is more depressed and has a bigger catch-up than biiliac diameter (Fig. 8), as in the male subjects. Biacromial ends at the 10th centile and biiliac at the 30th. The weight curve (Fig. 4) shows how deceptive weight is as a measure of growth response, for it increases at just the same rate off treatment as on it. This is due, of course, to the effect of treatment on fat, seen in the triceps skinfold (Fig. 5) (and better in the subscapular skinfold, not illustrated here). Each time growth hormone is given the skinfold diameters diminish, and each time it is withheld the skinfolds increase.

Bone maturity score (Fig. 6) increases each time growth hormone is given but remains very delayed, and full epiphyseal fusion has still not occurred at 20·6 years, although growth in height has ceased. Pubertal development is naturally much delayed, but takes place in a normal sequence, though very slowly. At 20·6, menarche has still not occurred, nor breast stage 5, but pubic hair reached stage 5 at age 19·6 years. It is possible that this subject may have a partial deficiency of gonadotrophins in addition to her growth hormone deficiency. The concurrence in the delay of menarche and epiphyseal fusion represents an example of the peculiar closeness in timing between skeletal maturity and menarche, which much exceeds that which exists between skeletal maturity and the stages of other pubertal characteristics (see Marshall, 1974; Marshall and Limongi, 1976).

The pictures on p. 145 show the response to treatment and the growth towards normality.

Subject No. 82



Treatment was started at age 12·6.

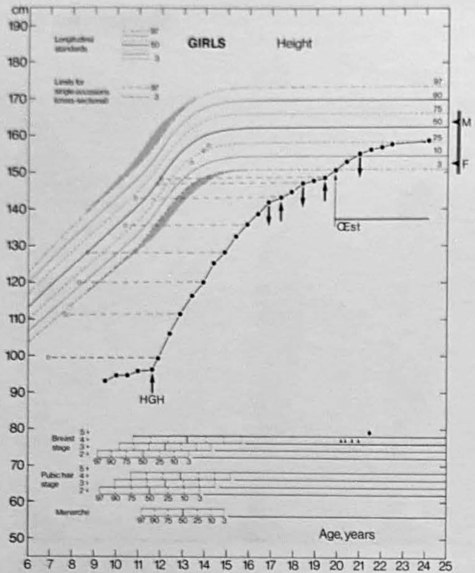


Fig. 1.

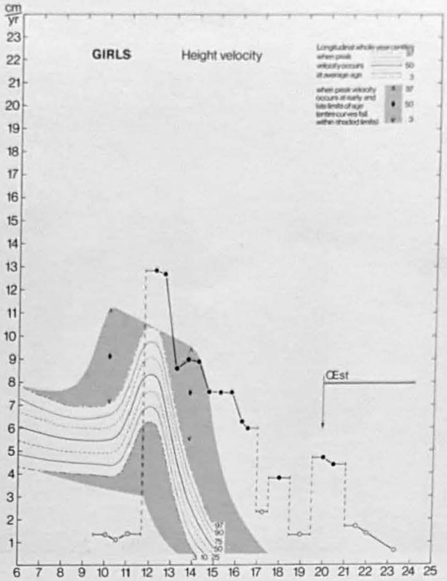


Fig. 2.

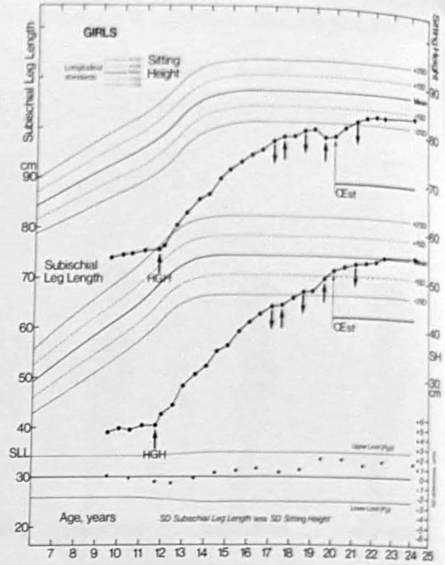


Fig. 3.

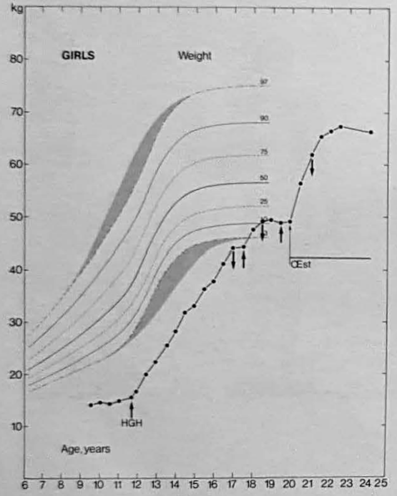


Fig. 4.

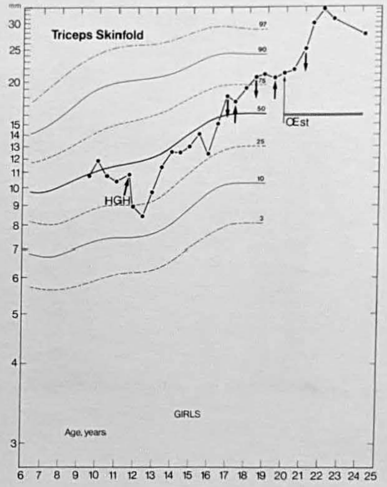


Fig. 5.

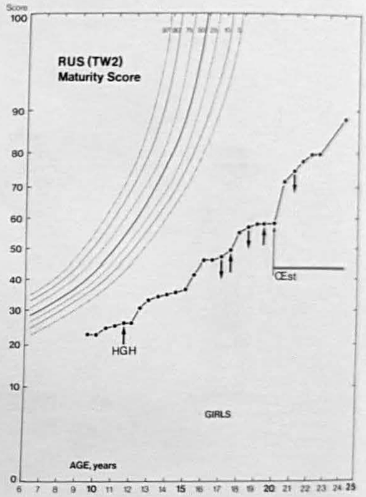


Fig. 6.

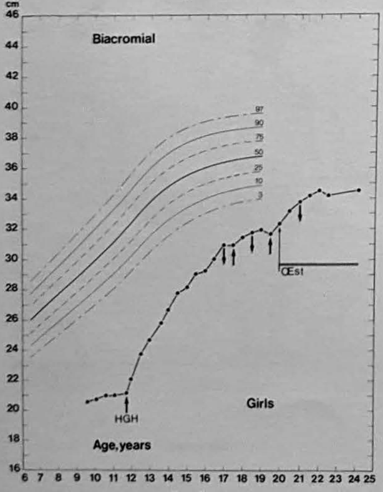


Fig. 7.

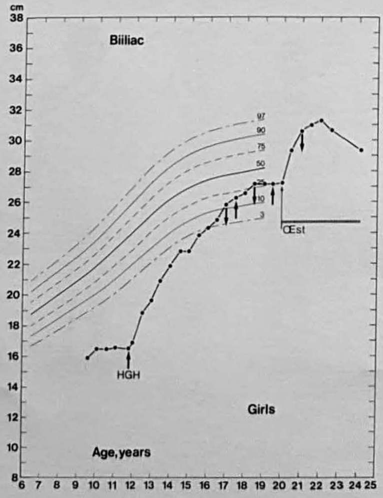


Fig. 8.

Growth Hormone Deficiency plus Gonadotrophin Deficiency *Subject No. 83*

This girl has growth hormone deficiency and a response to growth hormone which resembles that of the preceding subject. However, she also has a deficiency of gonadotrophins. All tests of thyroid function were normal, and there was no evidence of ACTH deficiency. The subject was second-born, of a normal pregnancy and labour, weighing 3630 g. Treatment started at age 11·7, but the bone age was only 6·9 "years". As her father was small, he was tested with insulin hypoglycaemia for growth hormone deficiency, but had a normal response.

The height curve (Fig. 1) shows an excellent and prolonged catch-up on treatment. During two periods off treatment height velocity is very much reduced (Fig. 2, open circles). Final height is actually above the average of the parental target.

Since no signs of puberty developed and the bone age became practically stationary from 18·5 years onwards (see Fig. 6), hope of a spontaneous puberty was abandoned and ethinyl oestradiol was given at age 19·9, when height had reached the 3rd centile. The oestradiol caused a rapid increase in skeletal maturity and breast development, and a large increase in weight (Fig. 4), skinfolds (Fig. 5) and biiliac diameter (Fig. 7). However, no growth of pubic hair occurred.

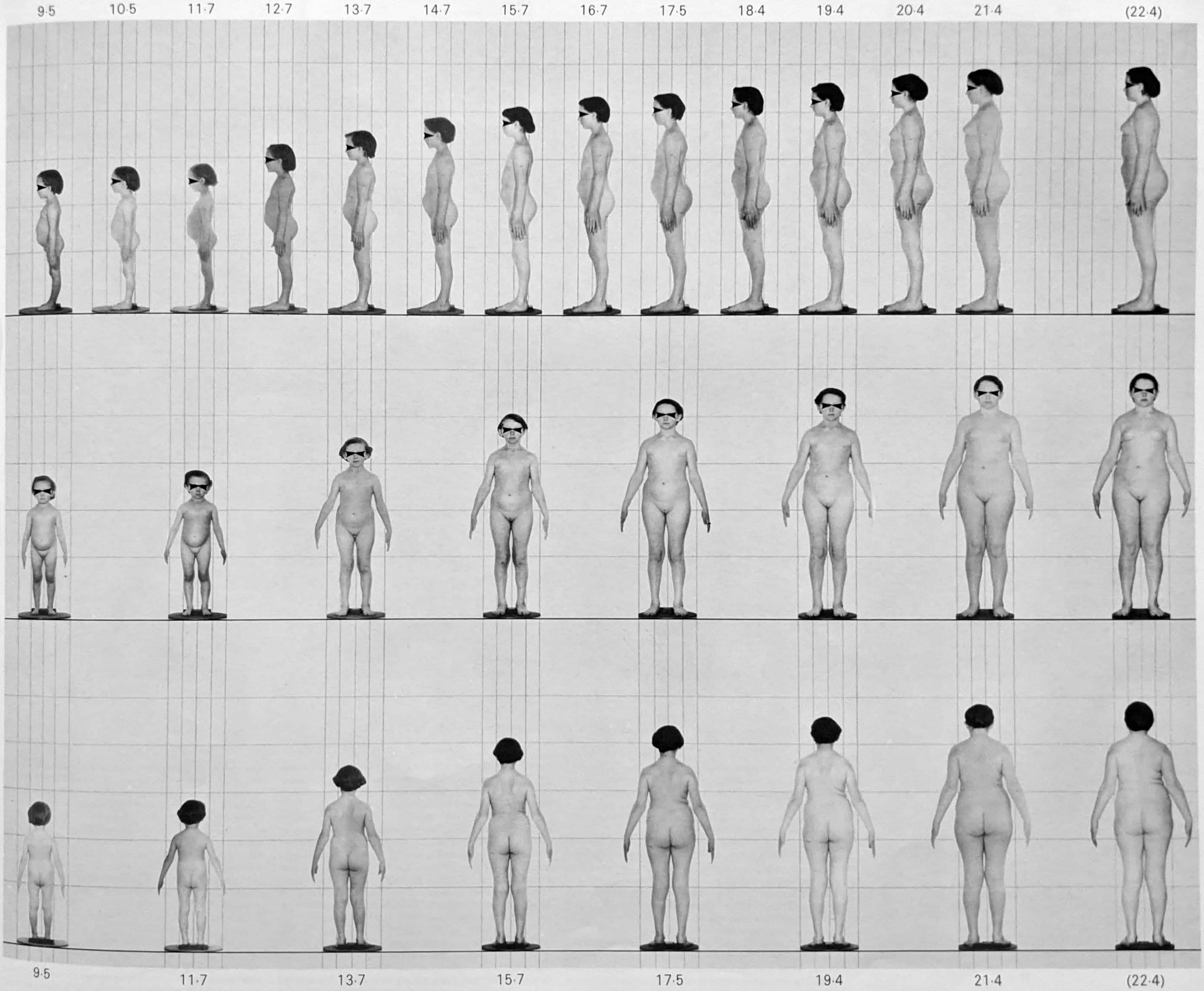
Sitting height and leg length (Fig. 3) are decreased more or less in proportion before treatment and both catch up well. Leg length ultimately reaches the mean value, but sitting height only to about −1·3 SD.

Biacromial diameter ultimately reaches the 3rd centile. Biiliac diameter shows a huge increase following oestrogen treatment. Some of this is undoubtedly due to fat accumulation, but certainly not all of it, and it represents, rather, the specific action of oestrogen on the cells of the Y-shaped cartilage in the acetabulum to cause the female increase in hip width at puberty (Tanner, 1962). As we gave a relatively high dose of oestrogen this presumably caused a greater-than-usual hip width response. (We have seen a similar thing in shoulder width response to large doses of administered testosterone in boys.)

Weight and triceps skinfold show a large increase following oestrogen. Skeletal maturity is very much delayed before treatment, increases only moderately on growth hormone, and fails to progress beyond the score of 60 (corresponding to a bone age of 12·0) until oestrogen is given. Even after 4 years of oestrogen complete epiphyseal fusion has not occurred, perhaps because of the lack of androgens as indicated by continuing absence of pubic hair.

The pictures show the steady height response and the excess weight put on with oestrogen in a girl whose physique was always high in endomorphy.

Subject No. 83



Age, years

Treatment was started at age 11·7.

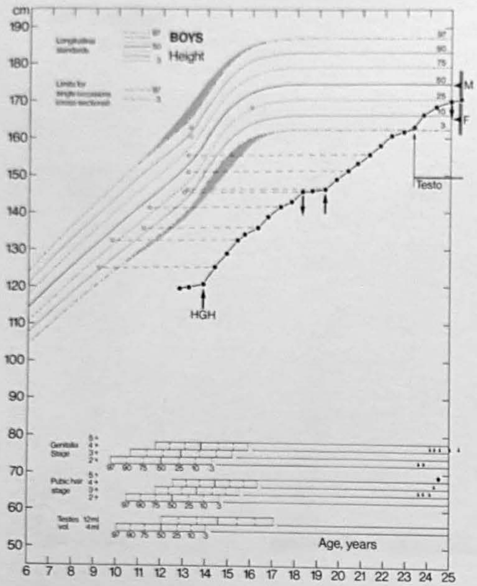


Fig. 1.

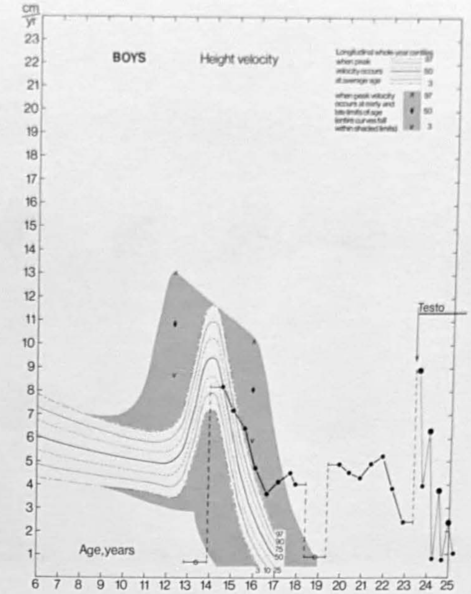


Fig. 2.

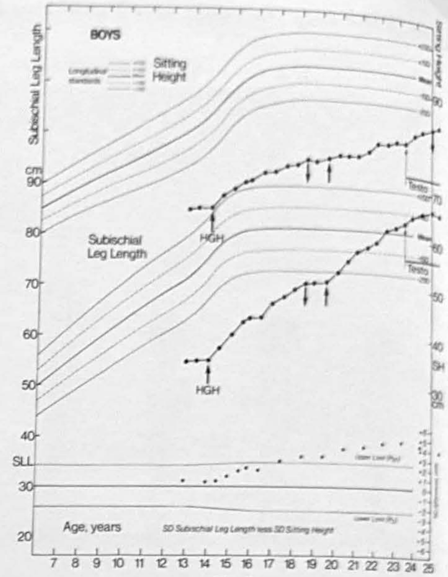


Fig. 3.

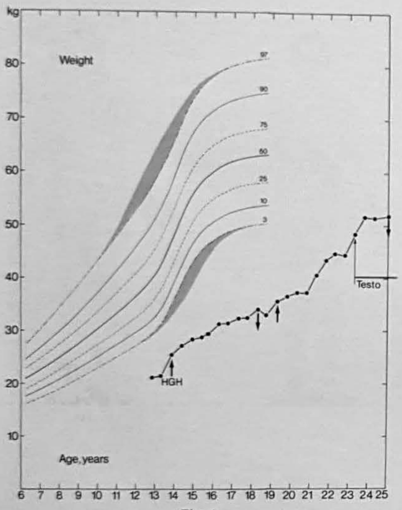


Fig. 4.

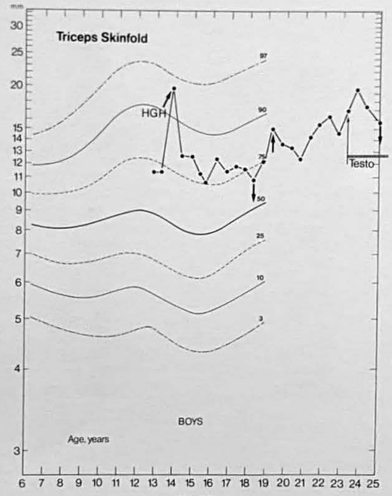


Fig. 5.

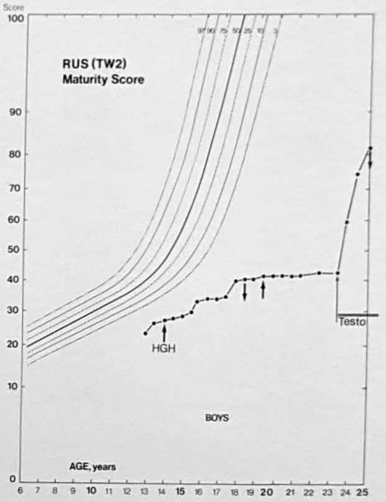


Fig. 6.

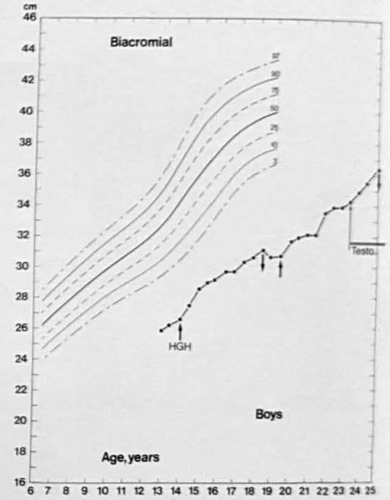


Fig. 7.

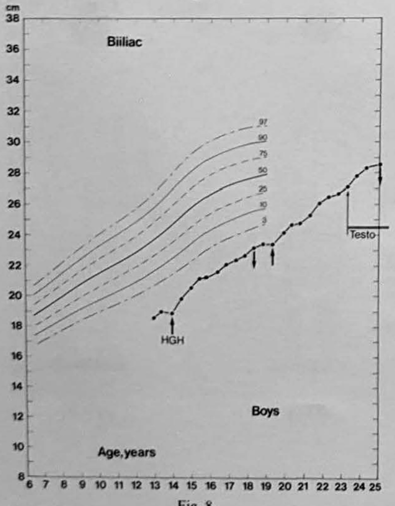


Fig. 8.

Growth Hormone Deficiency plus Gonadotrophin Deficiency

Subject No. 84

This boy has the same problem as the preceding subject, i.e., growth hormone deficiency combined with deficiency of gonadotrophins, but not of TSH or ACTH. He was born to a 40-year-old mother by Caesarian section at 40 weeks after a trial labour. Birthweight was 3860 g. He had one brother, 17 years older, who died of malignant hypertension at age 19.

Treatment with HGH started at 13·9 years, when the bone age was 9·0. This subject caught up in height (Fig. 1) by growing at a normal velocity for a prolonged time rather than by growing at a supranormal velocity for a short time. There was a period of a year off treatment, when he scarcely grew at all. By the time he had reached the 3rd centile for height his growth velocity (Fig. 2) had fallen to 2·4 cm/year and his bone maturity score (Fig. 6) had been stationary for 5 years at a bone age of 13·4 "years". No pubertal development had occurred. Testosterone was therefore given in a dose of 250 mg testosterone oenanthate each month. At the same time growth hormone was administered and withheld in alternating 3-monthly periods as a test to see whether or not it was a necessary adjunct for the effect of testosterone on growth (see Tanner *et al.*, 1976b).

The height curve shows an increase from the 3rd to the 25th centile on testosterone plus half-the-time growth hormone, and height ends just at the mid-parent centile. In the height velocity curve (Fig. 2) the large points represent periods of testosterone plus HGH, the regular-size points represent periods of testosterone only. Testosterone regularly causes a greater height increase when growth hormone is given simultaneously.

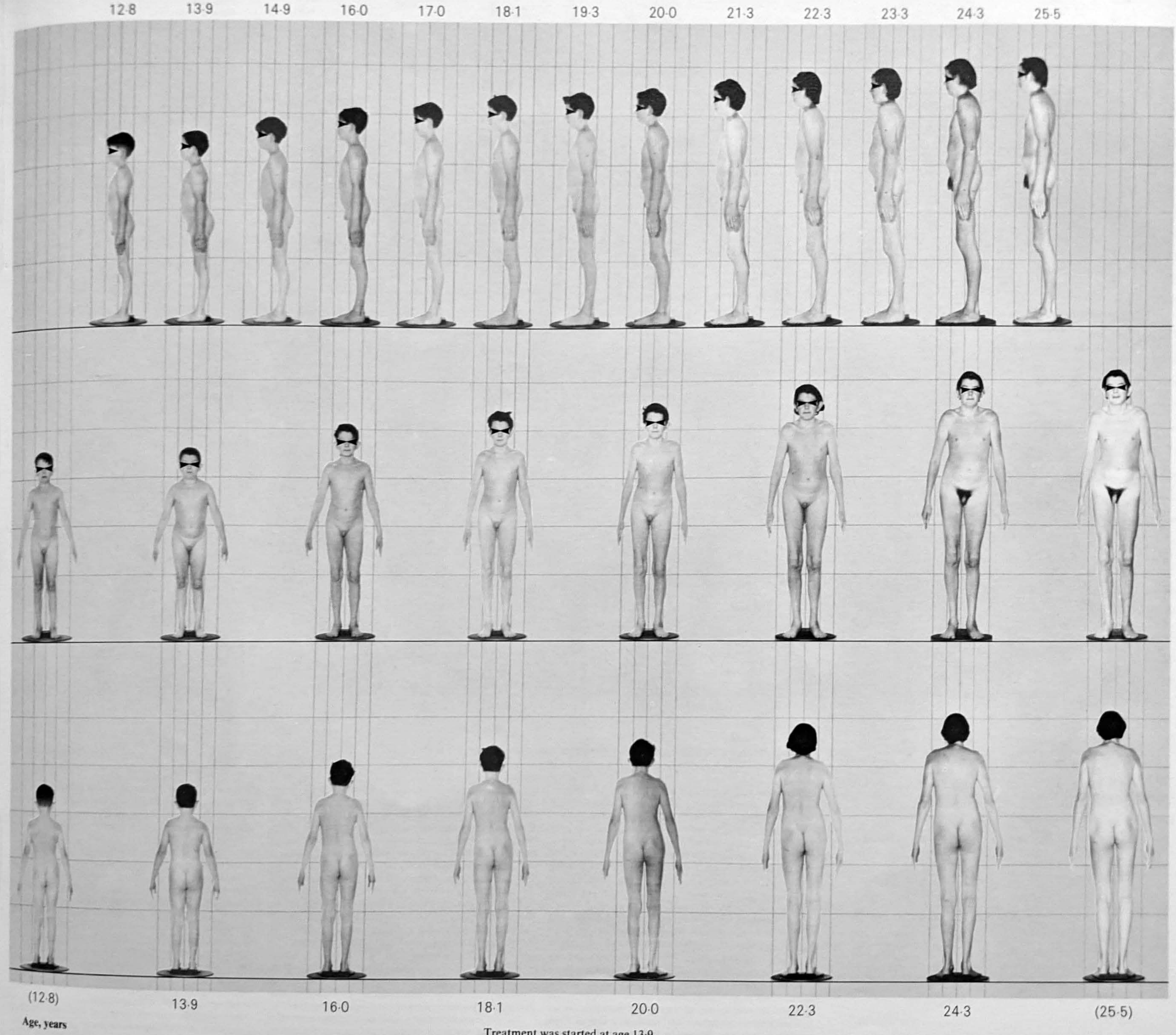
Sitting height and leg length (Fig. 3) differ from those of the preceding subjects. At age 14, before treatment starts, both are decreased to the same degree. During the growth hormone induced catch-up, however, the legs grow at a considerably greater velocity than the trunk, and during the year off growth hormone (18·3 to 19·3), both practically cease growing. When HGH is restarted leg length at once accelerates, but sitting height responds very slowly. Consequently, when height reaches the 3rd centile at age 23, leg length is already above the mean (+0·5 SD), whereas sitting height is far below it (−4·1 SD). Testosterone increases sitting height somewhat more than leg length, so that by age 25 the two values are: leg length +1·2 SD and sitting height −2·8 SD with the difference in SD scores far beyond the limits of normal. Clearly we would have done better to have started testosterone earlier; though total height would have been lower, the proportions of trunk and limbs would have been more normal. Indeed if we had started treatment after bone age had been stationary for about a year (our usual practice) that would probably have been about right. (There were special family problems militating against us doing so in this case.) The question arises as to whether a low level of testosterone and other androgens during pre-pubertal childhood is necessary for sitting height and leg length to grow in correct proportion. Proper control of patients like no. 84 requires careful monitoring of these measurements separately.

Biacromial diameter (Fig. 7) remains very much below the 3rd centile but keeps on growing gradually with a velocity sustained, if not actually increased, by the testosterone. Ultimately it reaches the 3rd centile. Biiliac diameter (Fig. 8) is not so small initially and ends at the 60th centile. Weight (Fig. 4) increases steadily to the 5th centile and triceps skinfold (Fig. 5) is between the 75th and 90th throughout, showing the usual response to growth hormone.

Skeletal maturity progresses very slowly indeed with little catch-up apparent from the growth hormone, and remains nearly stationary at a bone age of about 13 "years" until testosterone is given, when it increases rapidly. Growth of penis and scrotum and development of pubic and axillary hair occur soon after testosterone is started. The testes remain pre-pubertal, size 1 ml; 1 ml. Beard growth is sparse.

The pictures show the increasingly long legs as the pre-pubertal period continues, and the non-development of testes.

Subject No. 84



Treatment was started at age 13·9.

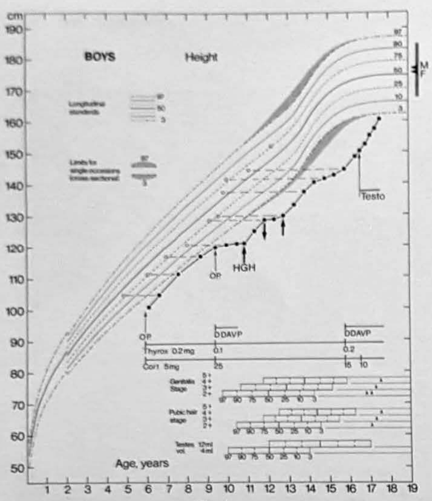


Fig. 1.

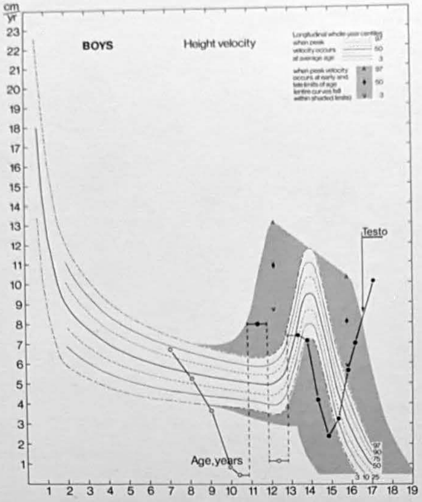


Fig. 2.

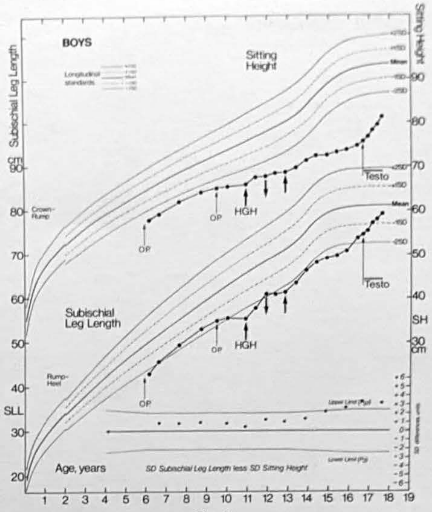


Fig. 3.

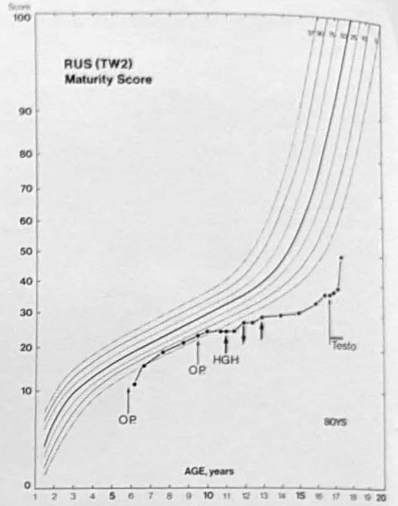


Fig. 4.

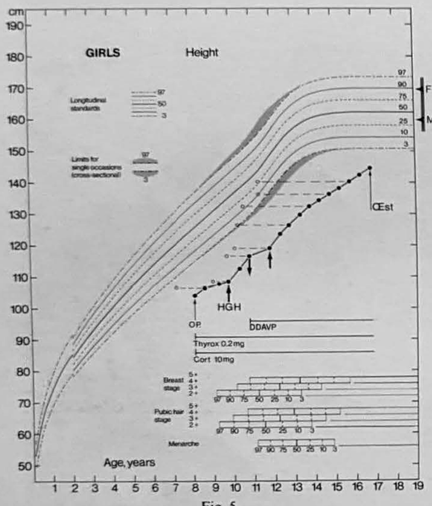


Fig. 5.

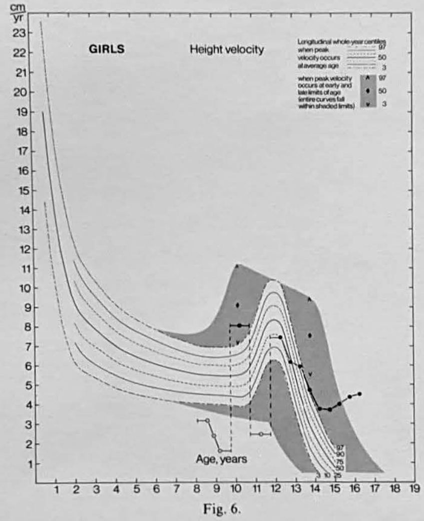


Fig. 6.

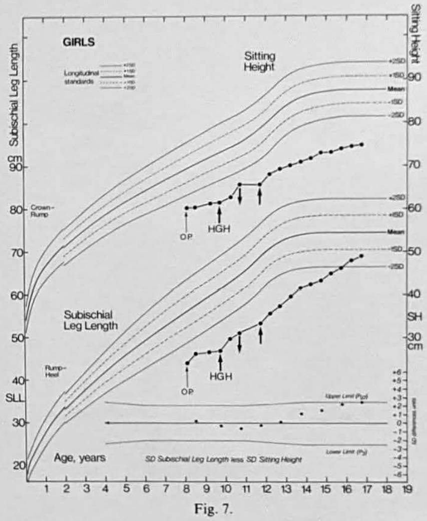


Fig. 7.

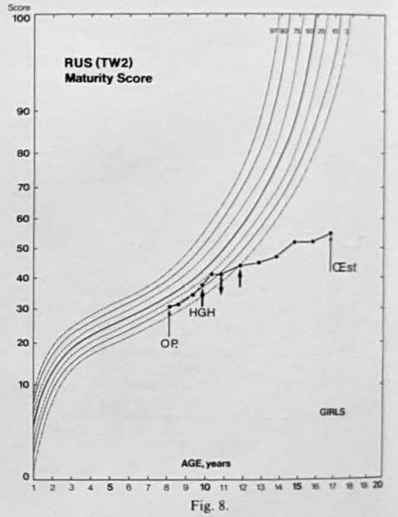


Fig. 8.

Multiple Pituitary Deficiencies due to Craniopharyngiomas

Subjects Nos 85 and 86

Figures 1–4 are subject no. 85 (boy).

Figures 5–8 are subject no. 86 (girl).

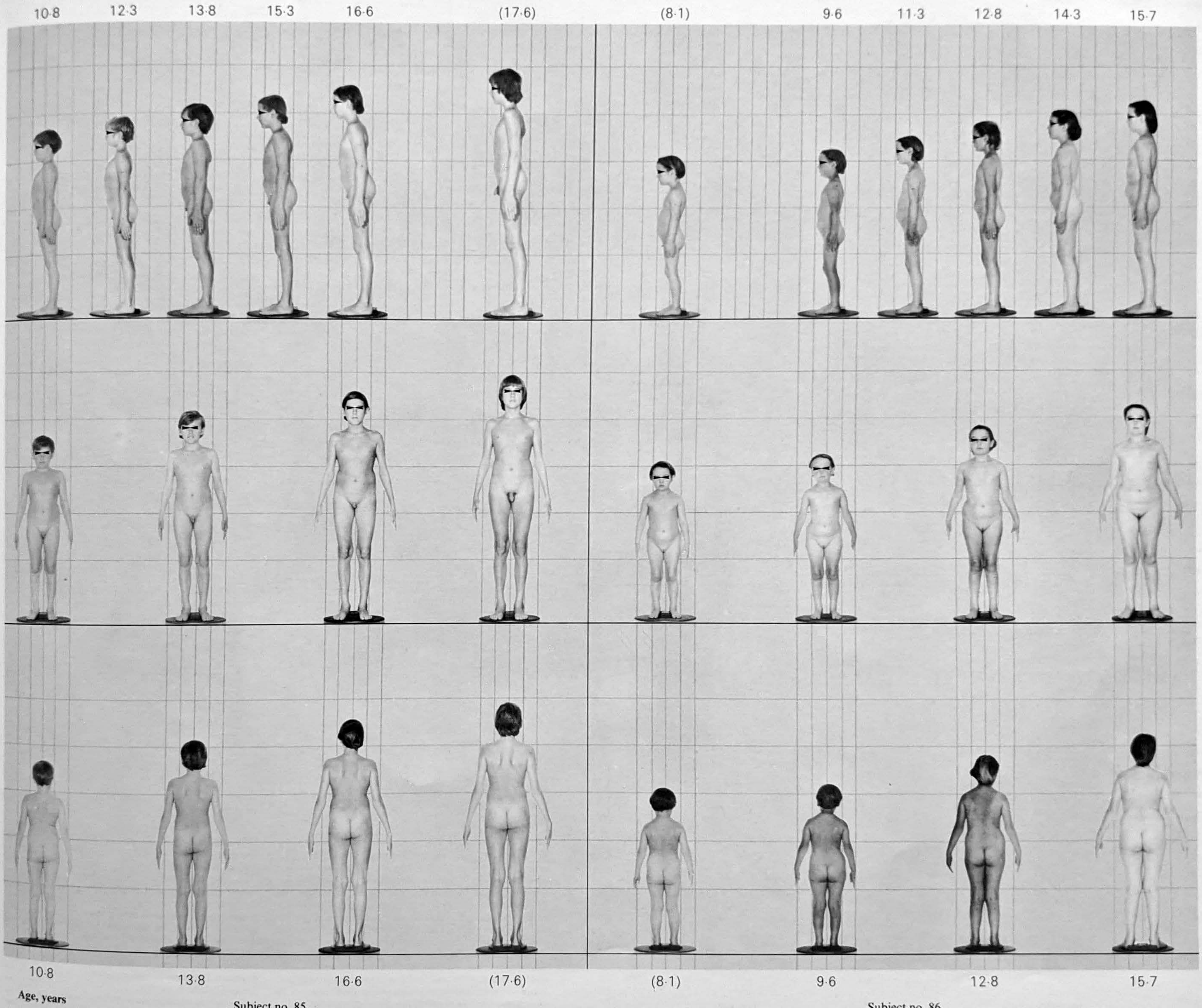
These subjects are a boy and girl with panhypopituitarism, i.e., lack of *all* pituitary hormones following the surgical removal of craniopharyngiomas. The boy (subject 85) was first seen at age 5·9, immediately after the removal of the tumour. He was given thyroxine 0·2 mg/day and cortisone 5 mg/day, with phenobarbitone; growth resumed for a time, but with progressively decreasing velocity. A year later symptoms of a space-occupying lesion returned, a second removal of the tumour was carried out and at age 9·4, a third removal. At this time he was slightly below the 3rd centile for height with bone age 18 months delayed. Growth hormone was given from age 10·9, (solid dots in the height velocity chart, Fig. 2) together with thyroxine 0·1 mg/day, cortisone 25 mg/day and vasopressin (later stopped). A good catch-up ensued. There was a year off growth hormone, a second catch-up and then a falling velocity from age 14 to 16. This was apparently chiefly due to lack of vasopressin; when DDAVP was given with 0·2 mg/day thyroxine and 15 mg/day cortisone the velocity increased again to 7·0 cm/year. At age 16·6 testosterone oenanthate was begun, in a dose of 50 mg monthly for 3 months, followed by 100 mg monthly. Cortisone was diminished to 10 mg/day and thyroxine and DDAVP continued. Height velocity increased to 10·3 cm/year and at 17·6 he was approaching the 3rd centile for height, with pubic hair and axillary hair ratings of 4 and 1, and bone age 14·5.

This boy's curves for sitting height and leg length (Fig. 3) resemble closely those of the preceding subject, who had growth hormone and gonadotrophin deficiency only. At first, sitting height and leg length are about equally affected, but as prepubertal growth proceeds, under the influence of HGH and the other replacements but without androgens, leg length velocity is restored to normal, but sitting height velocity remains low. By the time testosterone is started leg length is above the 3rd centile, whilst sitting height is far below it. At age 17·8 leg length has reached −0·5 SD while sitting height is still −3·6 SD. It is possible that continuing treatment will bring the difference of SD scores just to within normal limits again, but the legs will still be very long.

Biacromial diameter (not shown), though responding to the testosterone, falls progressively further below the centiles and is −4·0 SD at 17·8 years; biiliac diameter, in contrast, is a little below the 3rd centile at diagnosis and slightly above it at 17·8.

The girl (subject 86) had a craniopharyngioma removed at age 8·1 and was given thyroxine (0·2 mg/day) and cortisol (10 mg/day) from then on, with vasopressin added at age 10·8. Growth hormone was started at 9·8 and there was a good catch-up response. There is a low velocity during discontinuance of growth hormone and a small catch-up on its resumption. This subject also shows a much greater response in leg length than in sitting height (Fig. 7). When the treatment was started both were equally depressed, but at age 16·8 leg length has reached −1·3 SD and sitting height only −4·1 SD. The difference in SD scores has reached the upper limit. Despite apparently adequate dosage of thyroxine, bone age advances very slowly and is only 11·6 at chronological 16·8. Therapeutically there is a dilemma. Oestrogens do not have the sitting height stimulating effect of testosterone. Thus, if oestrogens are given now, height will stop short of the 3rd centile, but without too great a trunk-leg disproportion. If oestrogens are withheld for another 2 years, at her present rate of height growth, this subject will reach the 3rd centile, but have a worse disproportion of trunk and legs. At least oestrogens will start breast development. Ethinyloestradiol 10 µg daily 3 weeks out of 4, rising in 6 months to 20 µg daily was started at age 16·8, with 5 mg norethisterone daily for 5 days in the off-oestrogen week being added later.

Biacromial diameter (not shown) was much more depressed than biiliac, both at diagnosis and finally, just as in the boy. Biacromial stopped growing at −3·0 SD, whereas biiliac reached the 25th centile. The pictures show the development of the long legs in both subjects.



Subject no. 85.

Subject no. 86.

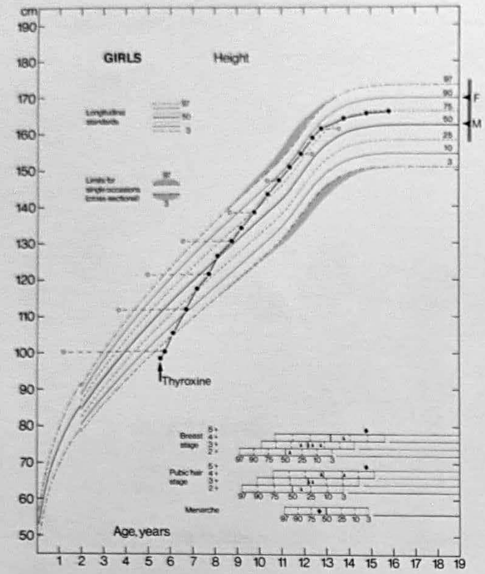


Fig. 1.

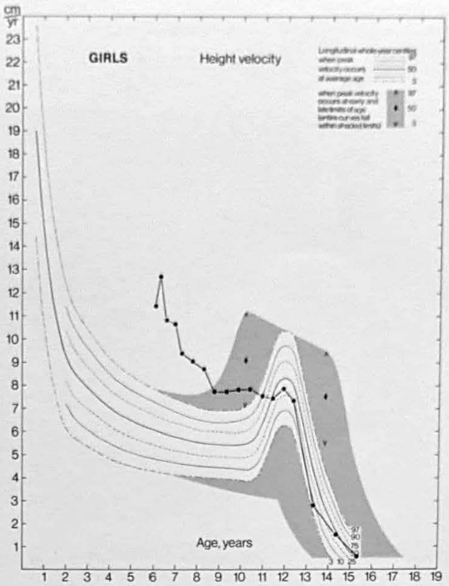


Fig. 2.

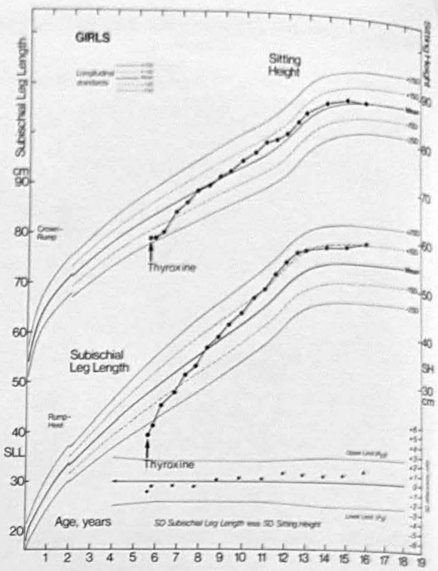


Fig. 3.

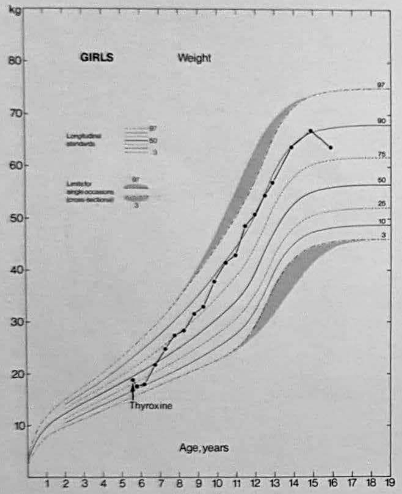


Fig. 4.

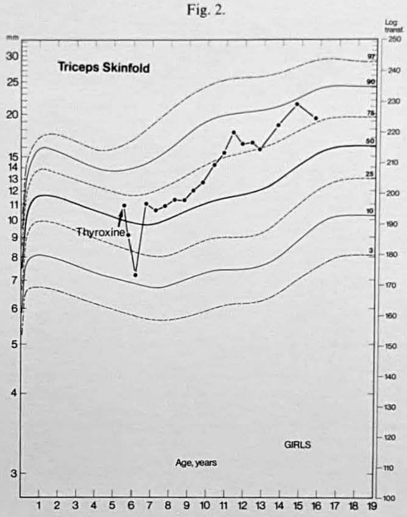
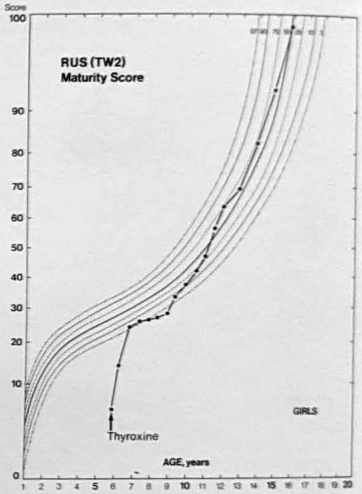


Fig. 5.



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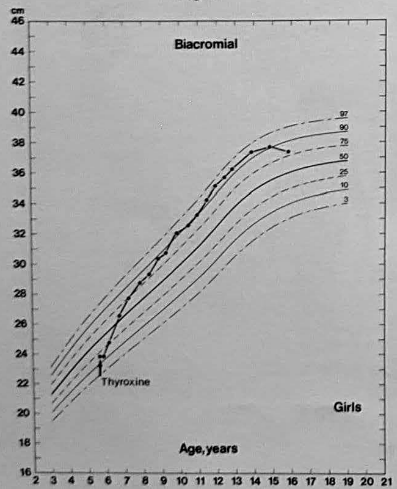


Fig. 7.

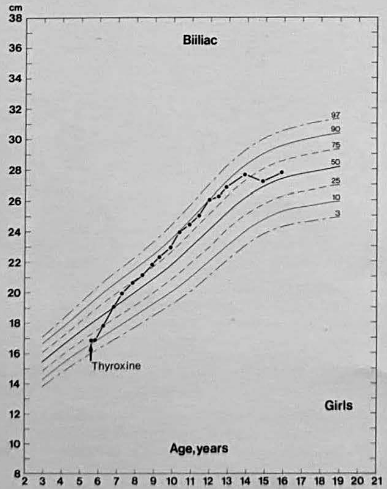


Fig. 8.

Primary Hypothyroidism *Subject No. 87*

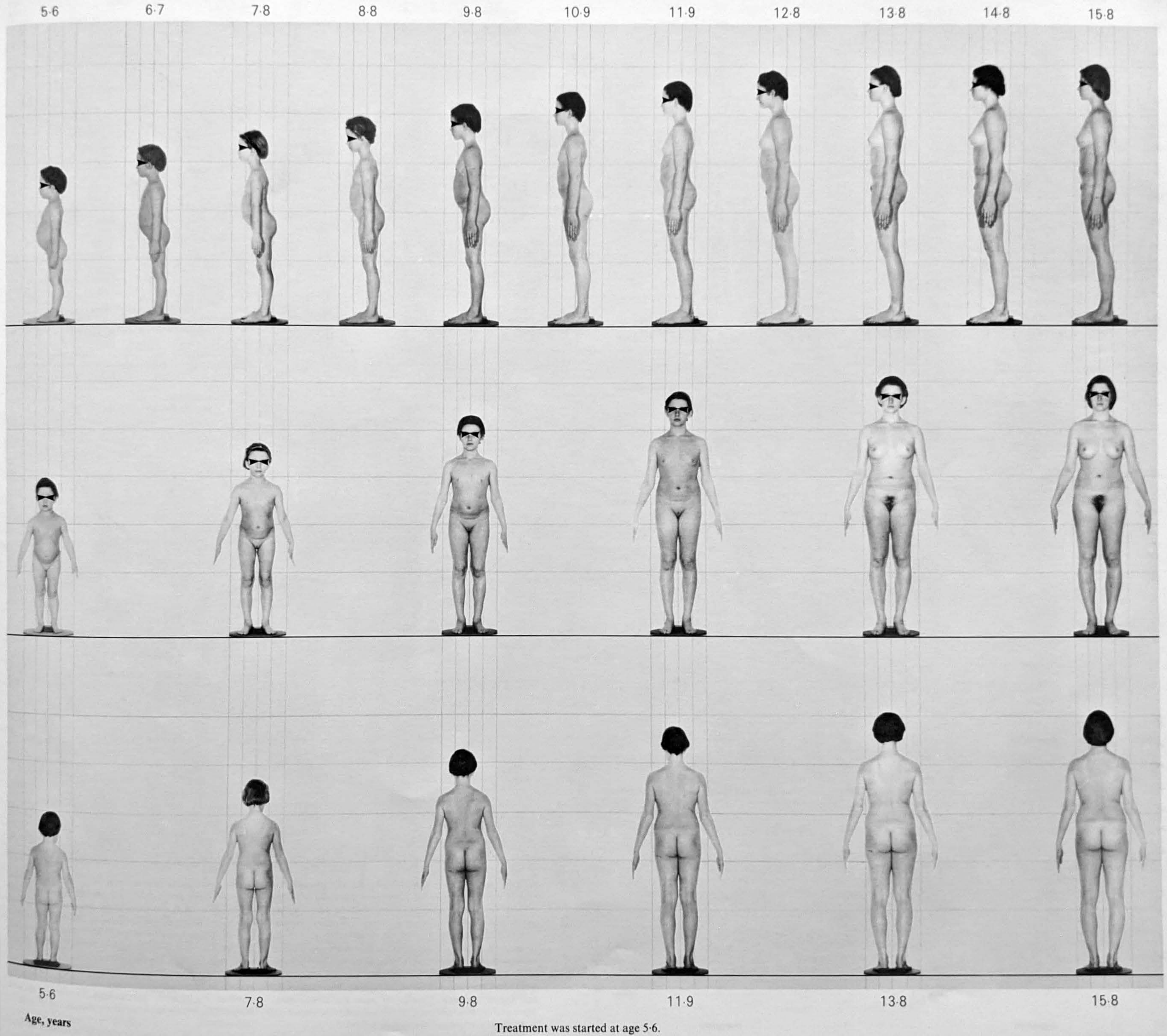
The first of two children with primary hypothyroidism, showing the classical catch-up on thyroxine replacement. The subject came to the clinic complaining of short stature; she was constipated and felt the cold. Her school work, however, had not suffered. She had a low level of blood thyroxine and a high TSH, and responded well to treatment with thyroxine. The height curve shows the catch-up, which is as marked in bone age (open circles in Fig. 1) as in height. She ends at the 75th centile, exactly in the centre of the parental height target. Puberty occurs normally, at about the average age. Menarche is a trifle early, following bone age, which is by this time advanced; pubic hair and breasts are a trifle late. In the height velocity curve (Fig. 2) only a very small adolescent growth spurt is visible since for the most part it has been absorbed into the catch-up curve.

Leg length is more depressed than sitting height (Fig. 3) when treatment starts, and has a slightly greater catch-up. It ends at +1·0 SD whereas sitting height is exactly at the mean. The trunk and limb proportion is thus well within normal limits and the slight preponderance of limbs should not necessarily be attributed either to the disorder or its treatment.

Biacromial diameter (Fig. 7) and biiliac diameter (Fig. 8) are both at the 10th centile when treatment starts, reach the 90th during the catch-up and end at the 75th and 60th respectively. Weight (Fig. 4) increases similarly, after an initial fall due to loss of myxoedema fluid, and triceps skinfold increases from the 60th to the 75th centile after a similar initial fall.

Skeletal maturity (Fig. 6) is very delayed initially and shows a very rapid catch-up to reach the 3rd centile after a year of treatment. It then moves more gradually to the 75th centile, and finally falls back to the 50th.

The first picture shows the hypothyroid appearance, with pot belly and puffy face, especially in the area of the mouth. These characteristics rapidly disappear, but the lordosis persists till puberty.



Treatment was started at age 5·6.

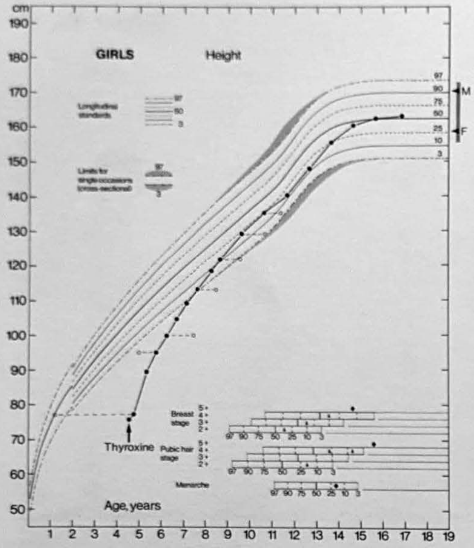


Fig. 1.

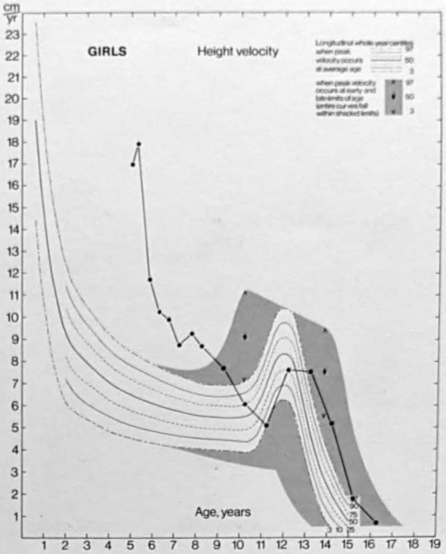


Fig. 2.

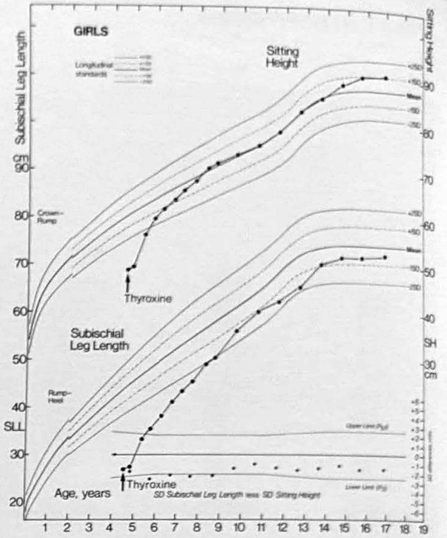
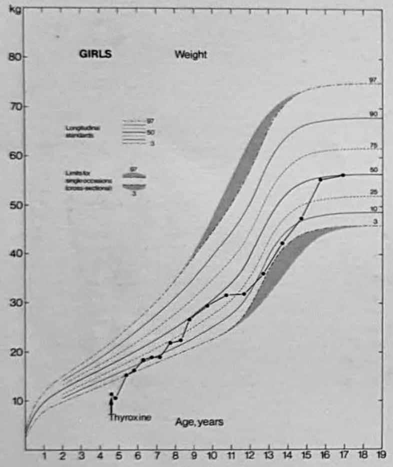


Fig. 3.



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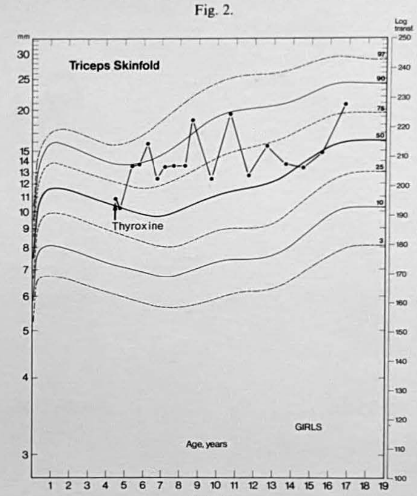


Fig. 5.

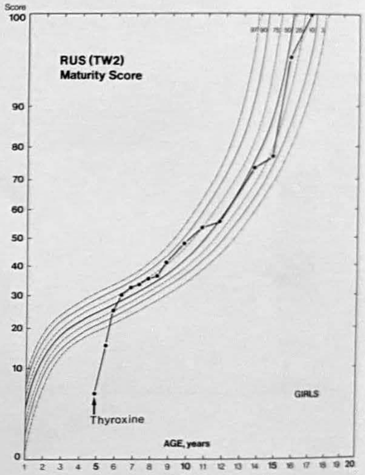


Fig. 6.

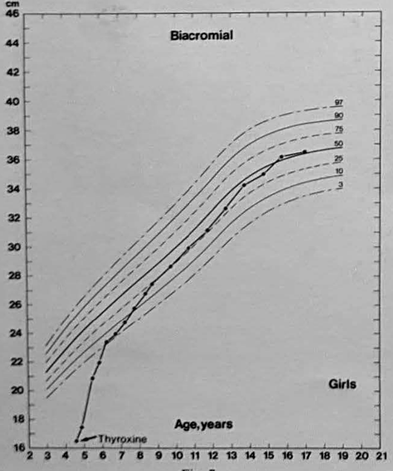


Fig. 7.

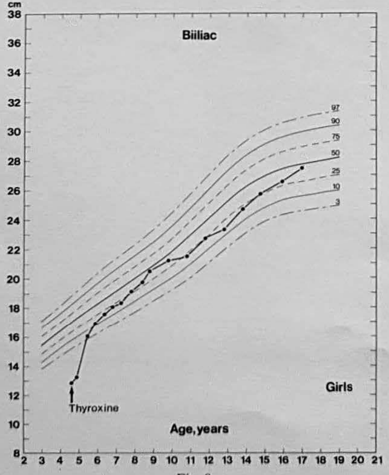


Fig. 8.

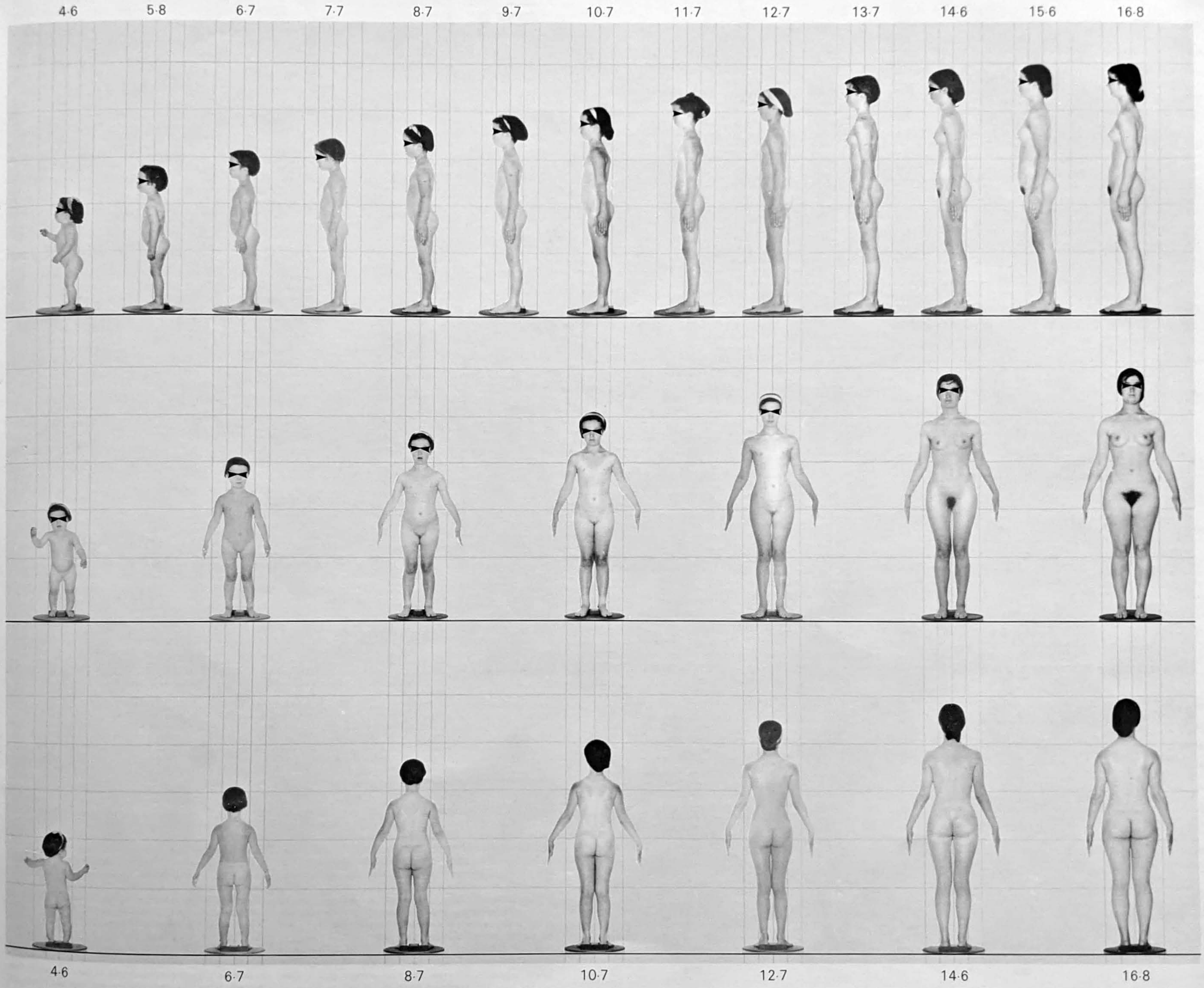
Primary Hypothyroidism *Subject No. 88*

A second girl with primary hypothyroidism. The height deficit (Fig. 1) at initial diagnosis was much worse than in the preceding subject. Thyroxine causes only a very transient loss of weight and skinfold, and the height velocity (Fig. 2) rises to high catch-up levels almost immediately. Skeletal maturity (Fig. 6) increases to above average in 2 years, but, despite bone age being in advance of chronological age, a perfectly normal final height is attained, being the 50th centile (see also Harnack *et al.*, 1972). In this case there was an unusual discrepancy between bone age and age at menarche. Despite the bone age advancement, menarche occurred only at 13·9 (20th centile) and breast and pubic hair development were equally delayed.

This subject had strikingly short legs relative to trunk from the time of diagnosis up to age 10. The difference between the SD scores remains at the lower limits despite treatment, the growth curves of the two segments being parallel during the catch-up phase. From 10 onwards the legs become relatively longer, and at maturity sitting height (Fig. 3) was +1 and leg length −0·5 SD, a difference well within the limits of normal. There is nothing to indicate whether the final slight shortness of the legs is a persisting effect of early hypothyroidism (as has been alleged) or is simply a normal variation.

Biacromial diameter (Fig. 7), extremely reduced at diagnosis, shows a very rapid catch-up and ends at the 50th centile. Biiliac diameter (Fig. 8), never quite so small, also ends at the 50th. Weight (Fig. 4) does the same; triceps skinfold lies between the 50th and 90th.

The first picture shows the classical appearance of frank hypothyroidism. The knock knees, very obvious in the second picture, gradually disappear.



Treatment was started at age 4·6.

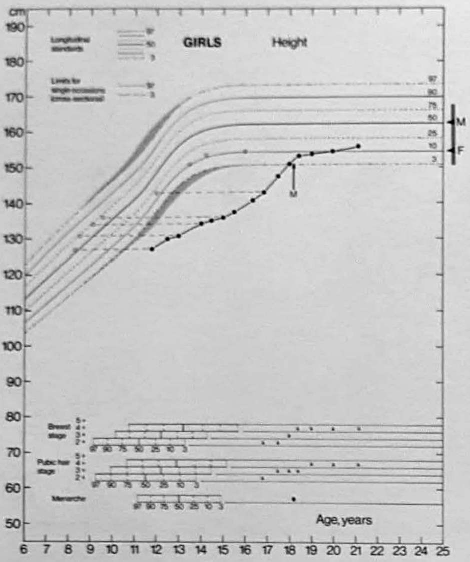


Fig. 1.

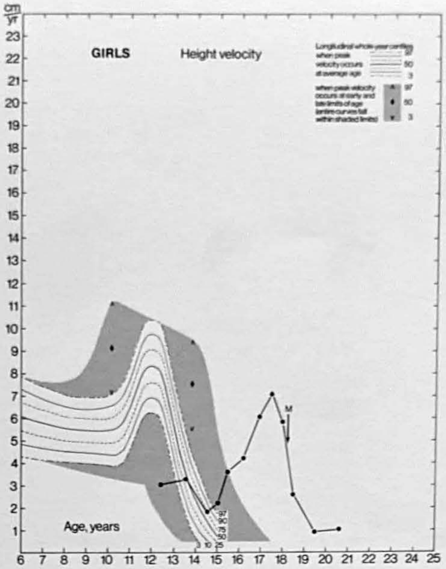


Fig. 2.

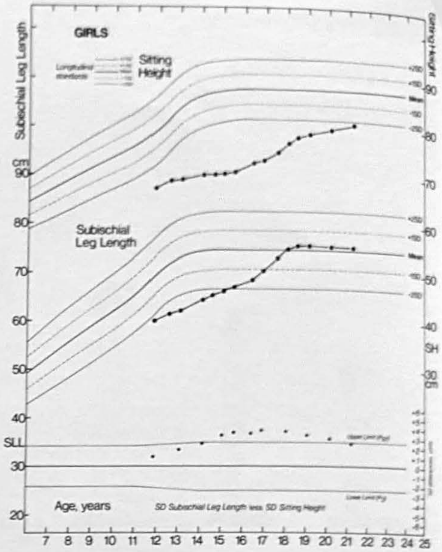


Fig. 3.

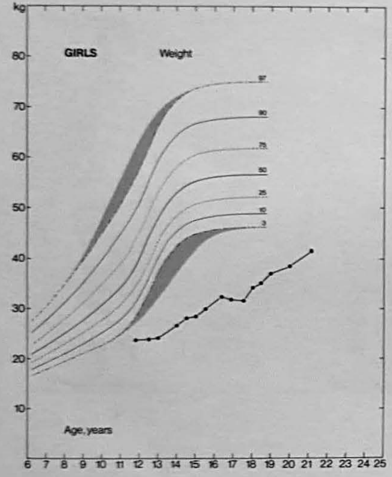


Fig. 4.

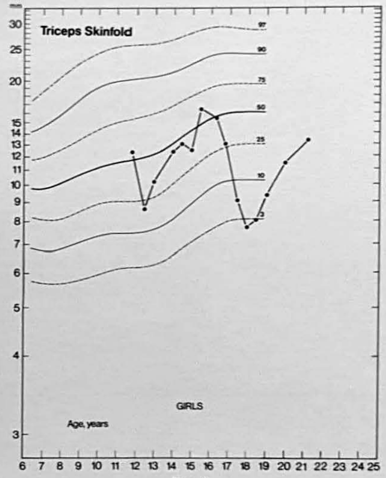
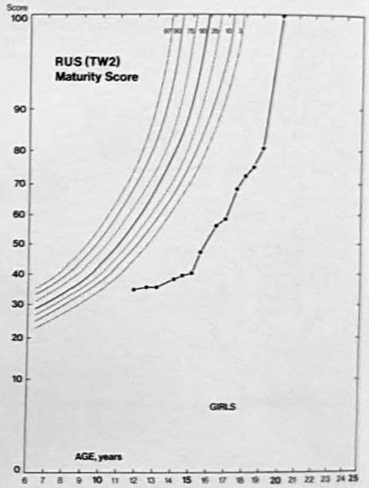


Fig. 5.



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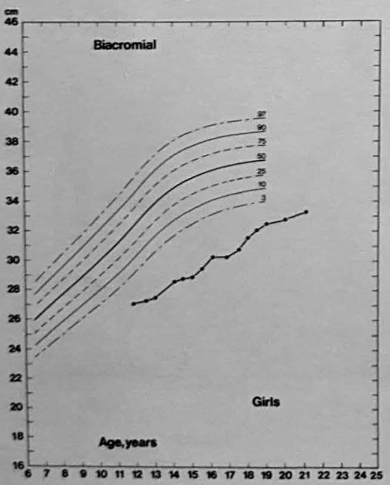

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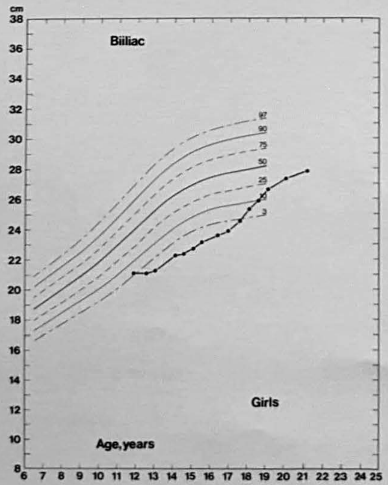


Fig. 8.

Constitutional Growth Delay

Subject No. 89

The first of three subjects with the diagnosis Growth Delay. This subject is very delayed and genetically fairly small, with parental height centiles averaging the 30th. She was the first of three children, born of a normal full-term pregnancy, birthweight 2950 g. Endocrine studies were normal. She had no treatment except reassurance and psychological support. Frequently one or other of the parents of such patients has also been a very late developer, but this was not so in her case.

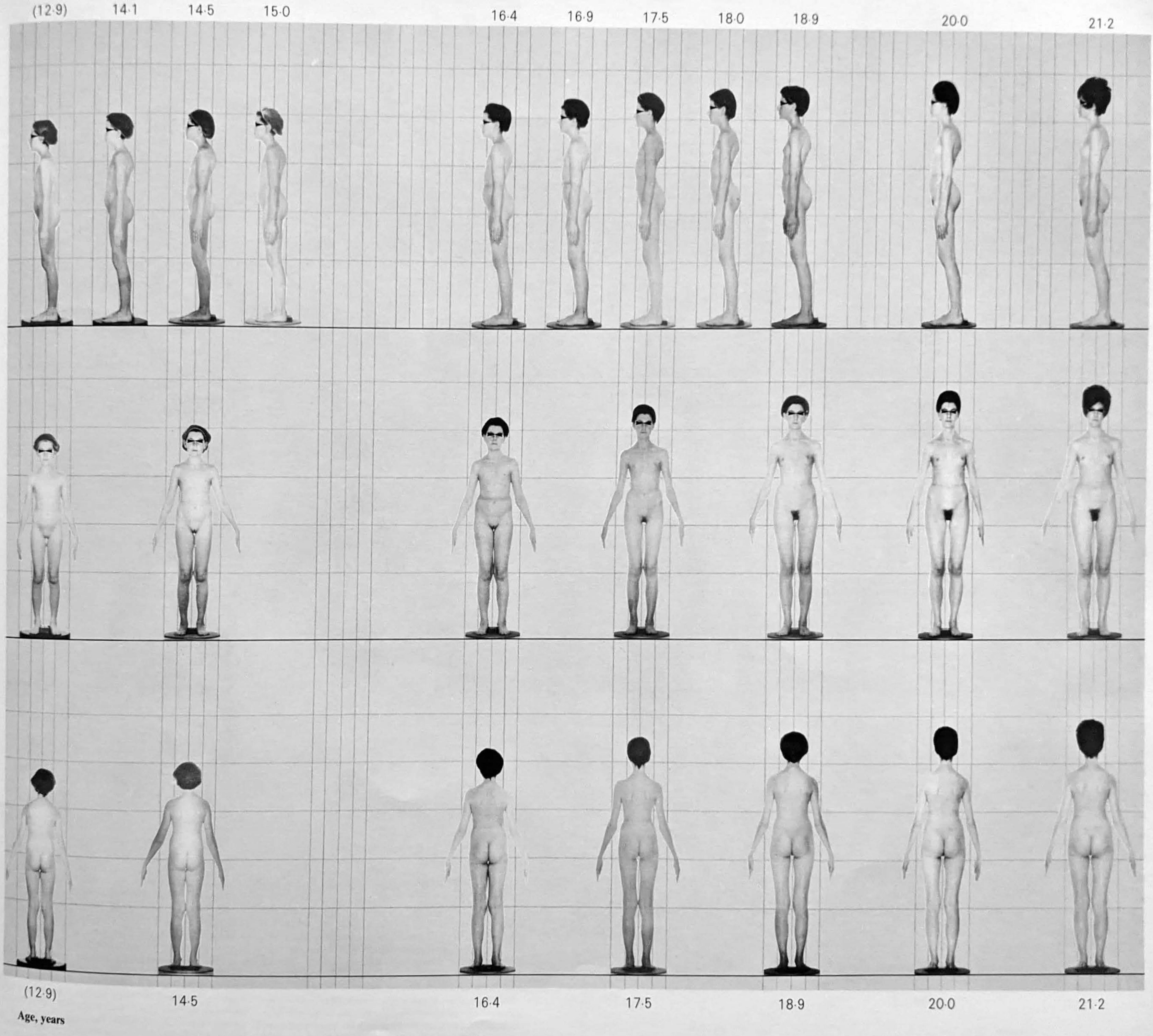
The height (Fig. 1) and height velocity (Fig. 2) curves are normal in shape but grossly disordered in relation to age. Peak height velocity is 5·5 years later than average, that is about −6 SD late. The height of the peak, as well as its shape, however, is quite normal. Menarche, at 18·3 years, is also 5 years late, but occurs at quite the usual time in relation both to peak height velocity and to bone age (13·7 "years" at menarche). The relation of pubic hair and breast development to menarche and to the height peak is also within normal limits.

Leg length is relatively greater than sitting height (Fig. 3), as in most predominantly ectomorphic persons, such as this subject. Leg length ends slightly above the 50th centile while sitting height ends at the 3rd. The difference in SDs is finally +2·2 units, which is at the limit of normal.

Biacromial diameter (Fig. 7) is small and never quite reaches the 3rd centile, while biiliac diameter (Fig. 8) ends at the 40th. Weight (Fig. 4) ends below the 3rd. Triceps skinfold (Fig. 5) shows a much greater decline during the adolescent spurt than is usual in girls, but returns finally to the 25th centile. Bone maturity score (Fig. 6) is very low but from age 15 onwards increases parallel to the 50th centile.

The pictures show a highly ectomorphic girl with the small breasts often accompanying this physique. If the ages were changed by about 5 years, she would not be unusual.

Subject No. 89



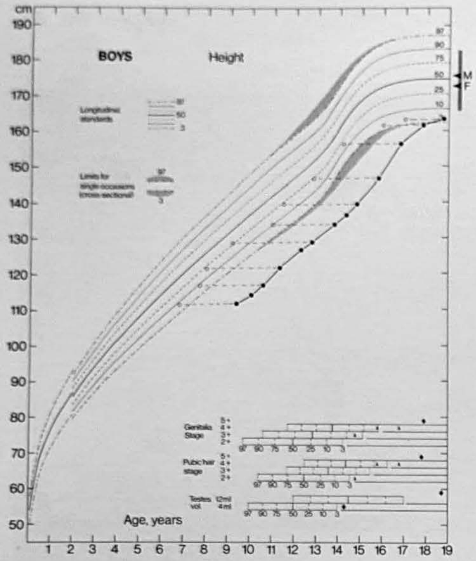
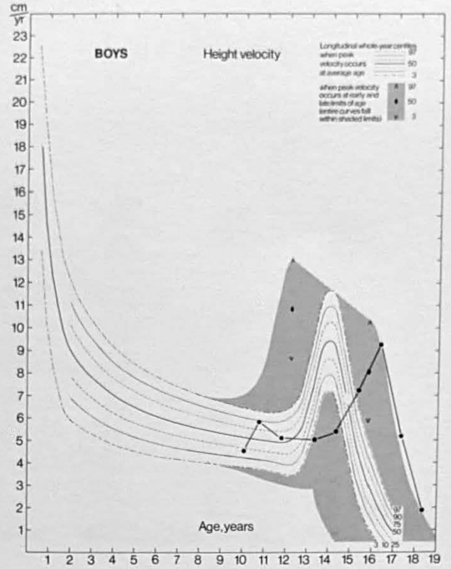


Fig. 1.



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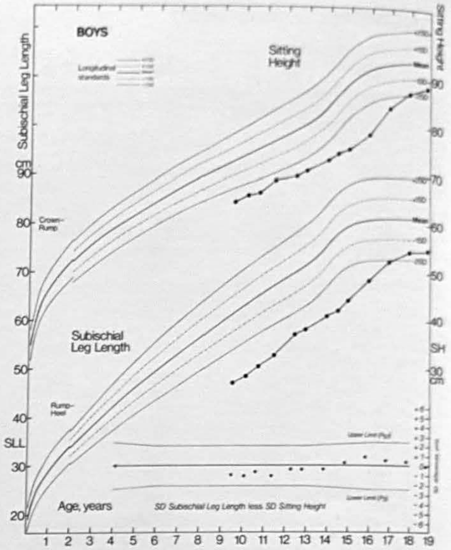

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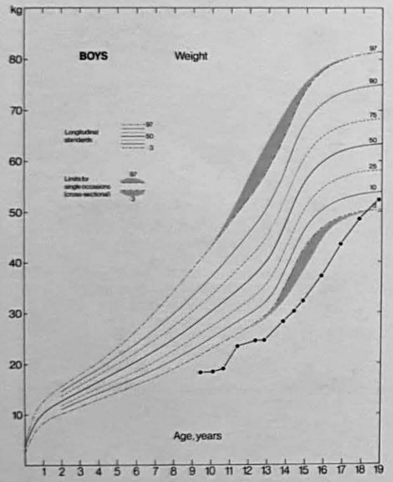

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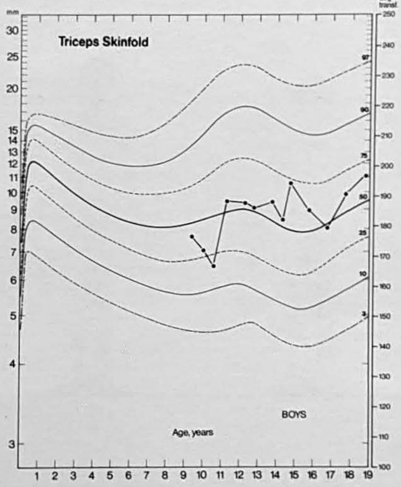

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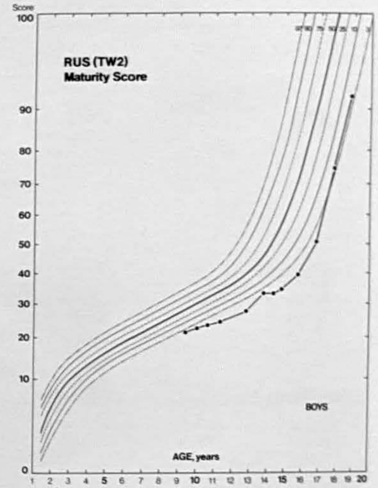

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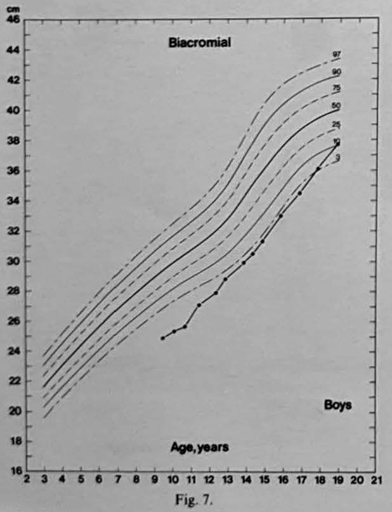

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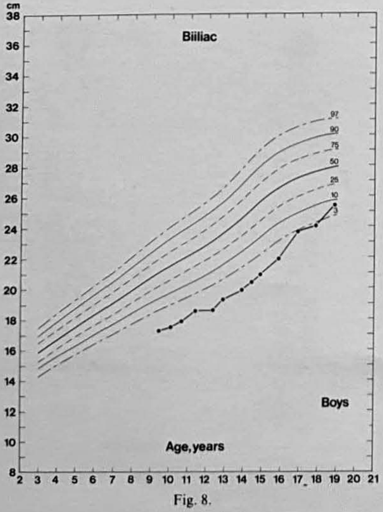


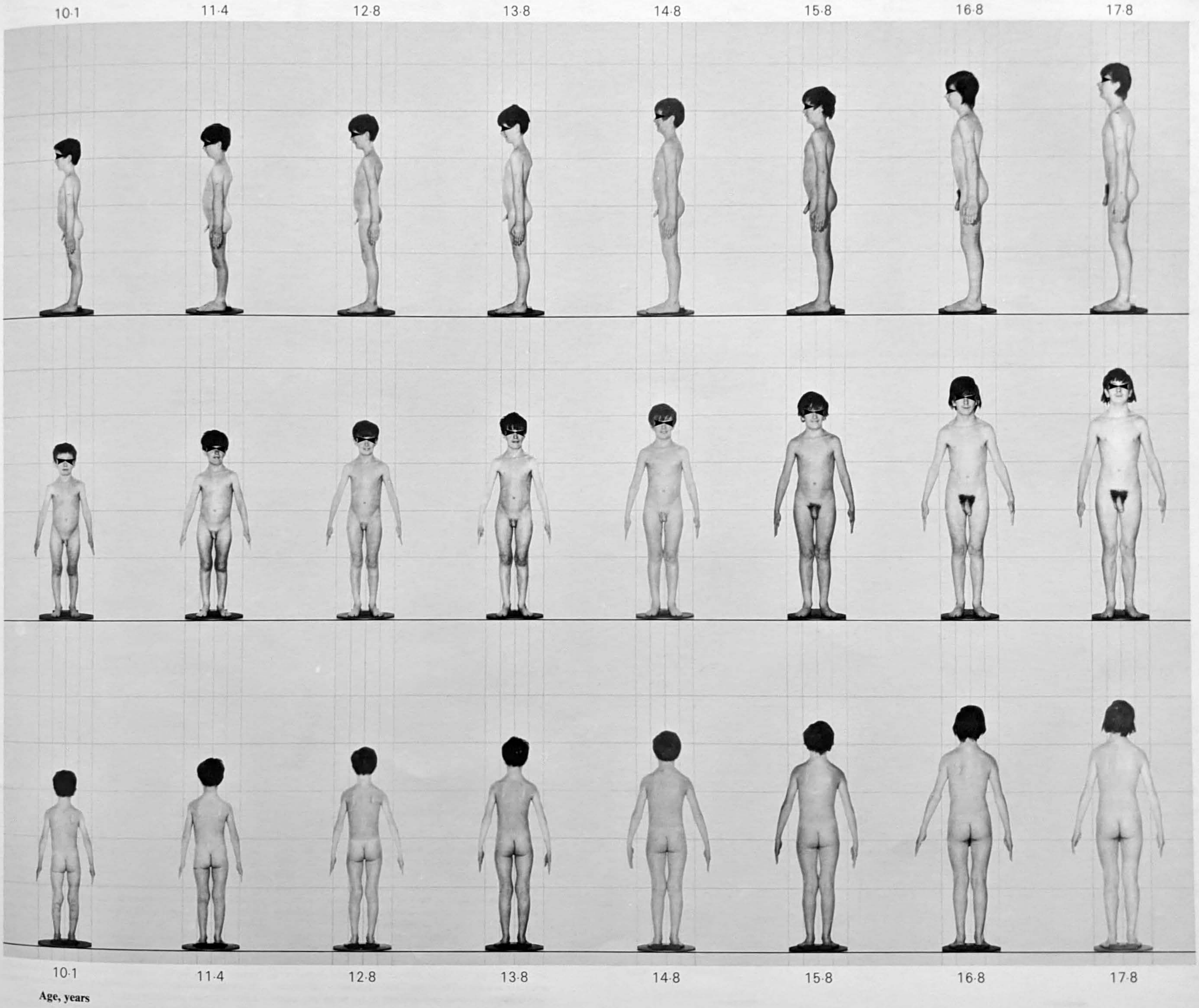
Fig. 8.

Constitutional Growth Delay *Subject No. 90*

A second subject with the diagnosis Growth Delay. Like the preceding subject, he is more delayed than genetically small; indeed his parents average the 40th centile for height. He was a first-born child, of normal pregnancy and delivery, weighing 2950 g. He came to the clinic at age 9 complaining of being small for his age.

His height (Fig. 1) and height velocity (Fig. 2) curves are quite normal in shape but very delayed. Peak height velocity is 2·2 years late, which agrees closely with the delay in bone age, and also with the delay in genitalia and pubic hair stages, all of which take place a little later than the 3rd centile. The amplitude of peak height velocity, however, is well above average and this subject's mature height predicted from height and bone age at the last occasion available, which was at age 18·8, is 163·2 cm. This is well within normal population limits, and very near the lower border of the target range of heights expected from the parents.

Sitting height (Fig. 3) is initially relatively greater than leg length but at maturity the proportions are just about average. Biacromial diameter (Fig. 7) reaches the 10th centile, biiliac diameter (Fig. 8), the 5th centile, and weight (Fig. 4) the 5th. Triceps skinfold (Fig. 5) is throughout near average. Skeletal maturity (Fig. 6) is below the 3rd centile, but not nearly as delayed as in the previous subject.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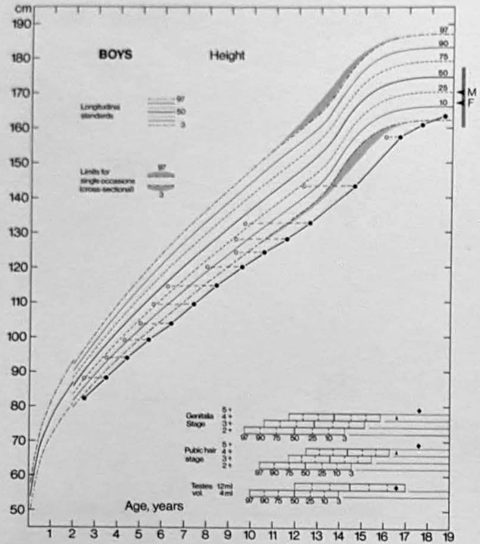
Age, years



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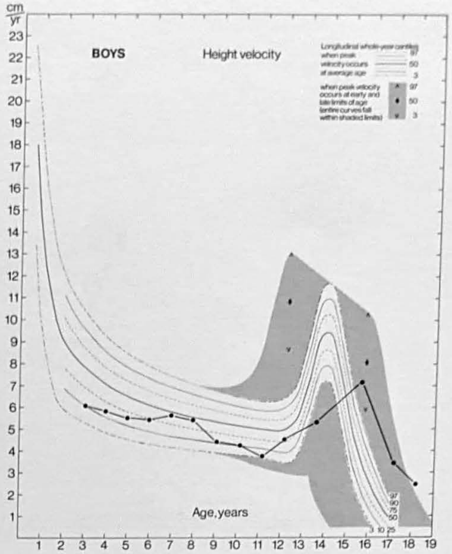

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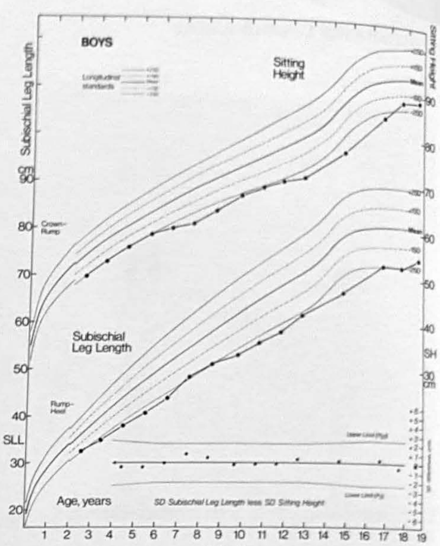
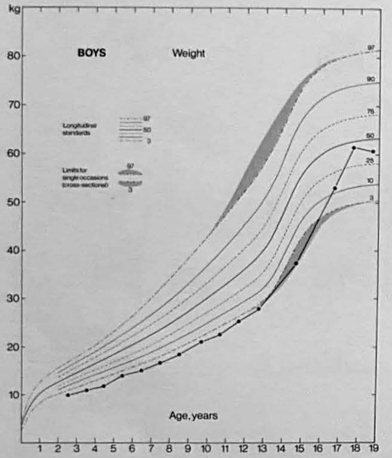


Fig. 3.



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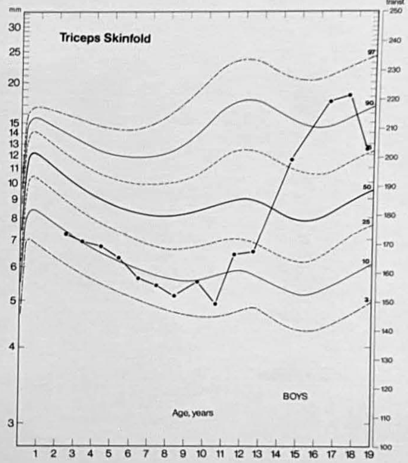

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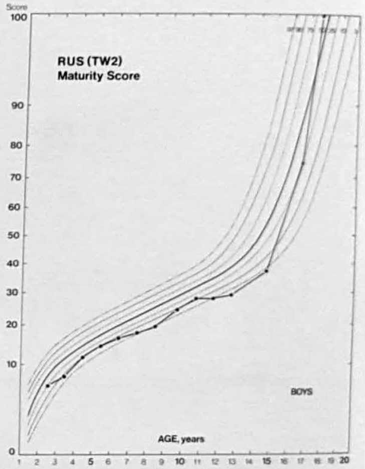

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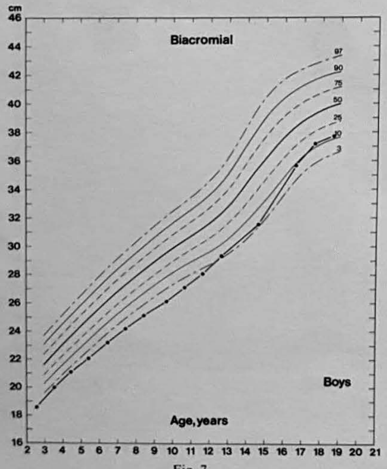

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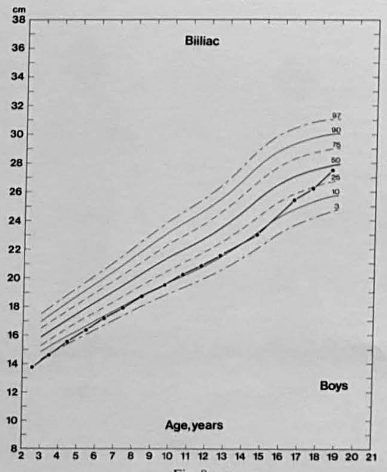


Fig. 8.

Constitutional Growth Delay

Subject No. 91

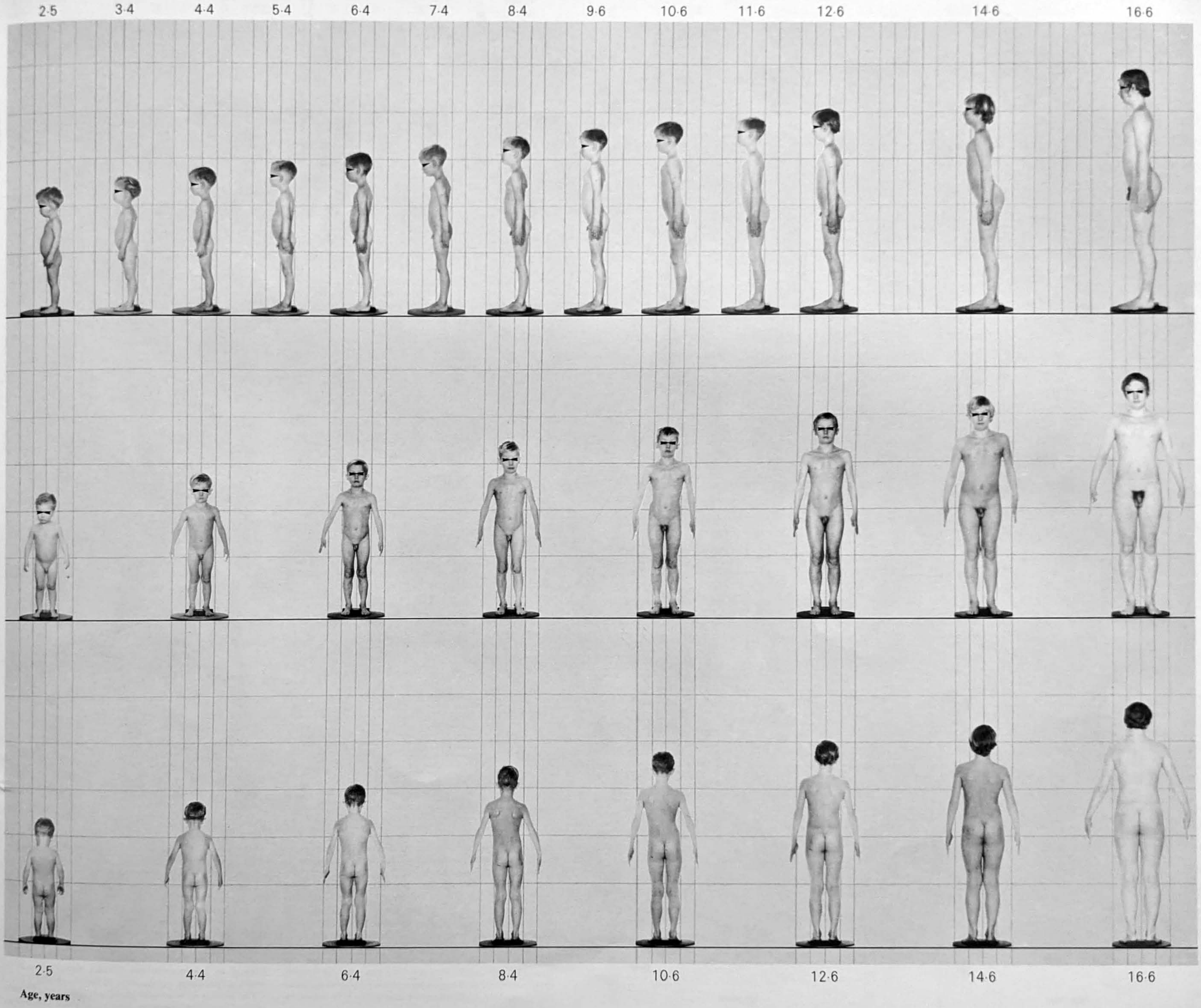
The last of our three examples of the very common diagnosis Growth Delay, traditionally but erroneously called "constitutional delay of puberty" by endocrinologists. Actually the delay antedates puberty by many years, as this subject in particular demonstrates. He was first-born, of a pregnancy complicated by pre-eclamptic toxaemia, with birthweight 2920 g at 40 weeks (−1·3 SD) and an uneventful delivery.

He was always small; his parental height centiles average the 20th, but to this he added a delay of 1 year increasing to 2 years. His age of peak height velocity (Fig. 2) is not well located since we only saw him at 2-year intervals at this time; however, it approximates the −2 SD mark. This is in accord with bone age and with the pubertal developments as far as we can locate them. Adult height is within the parental target and above the 3rd population centile.

Sitting height and leg length (Fig. 3) are at similar centiles throughout, with leg and trunk proportions average. Biacromial diameter (Fig. 7) rises from the 3rd to the 10th centile, biiliac diameter (Fig. 8) from the 3rd to the 40th. Weight (Fig. 4) rises to nearly the 50th during puberty and triceps skinfold (Fig. 5) reflects the increasing obesity at this time. Skeletal maturity (Fig. 6) is seldom quite outside the lower limit of normal, though always near it.

If this subject's parents had been of average height he could have carried this degree of delay without being noticeably small. Equally, if he had not been delayed he could have sustained his genetic stature centile. In many of these subjects, it seems it is the confluence of the two factors that pulls the attained height down to anxiety-producing levels.

The pictures show a smallish boy of central somatotype. He is badly posed at age 14·6, but does have some degree of lordosis throughout.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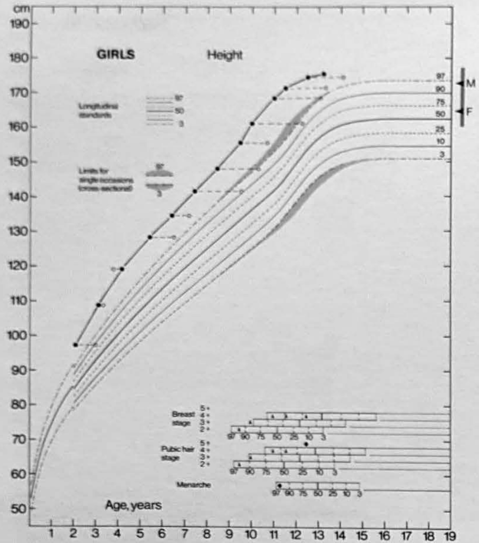
Age, years



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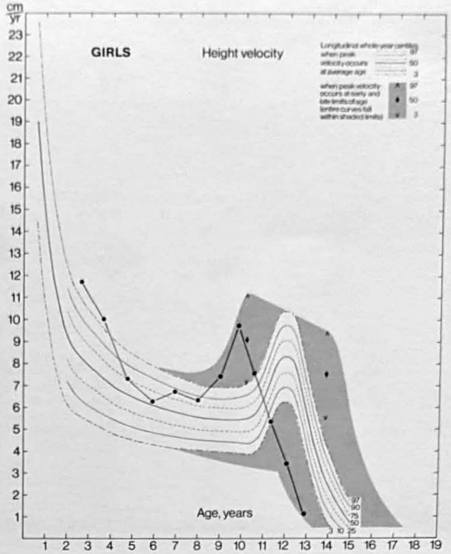

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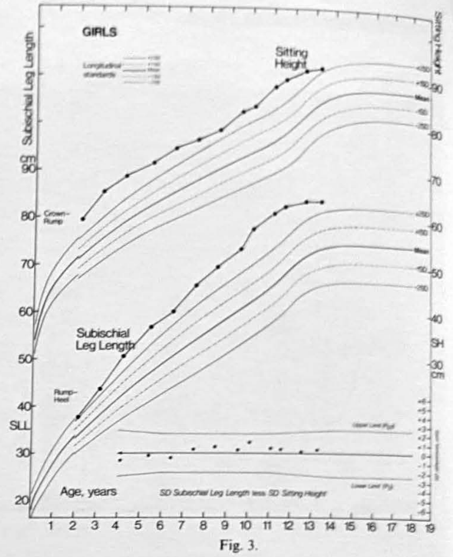

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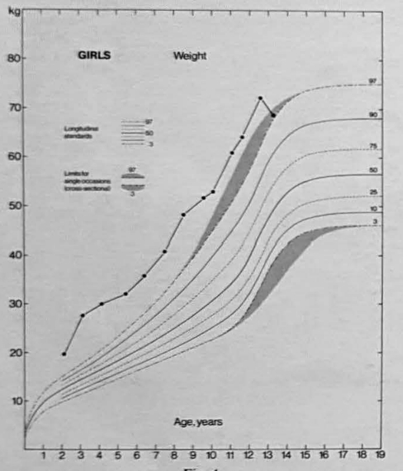

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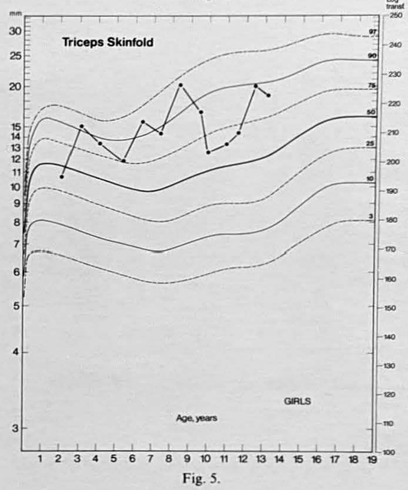
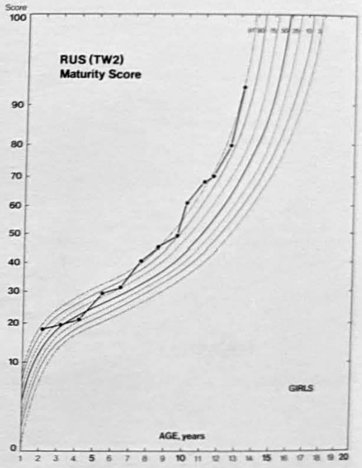


Fig. 5.



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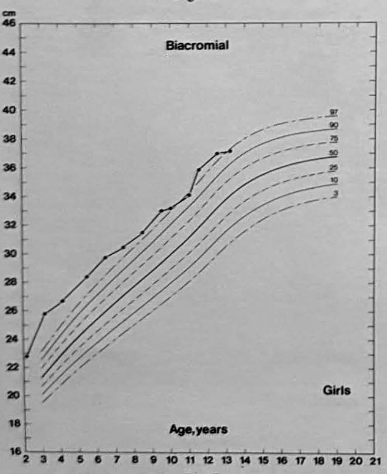


Fig. 7.

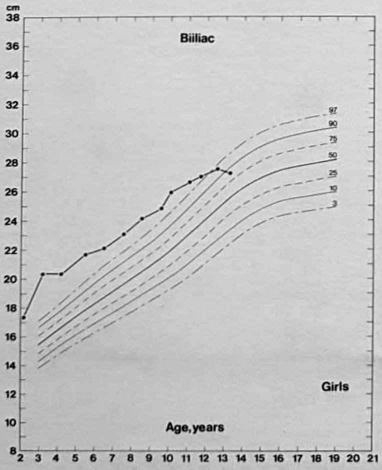


Fig. 8.

Constitutional Tallness *Subject No. 92*

A subject with the opposite condition to that of the last three. She has tall parents, averaging the 90th centile, which gives the upper edge of the target height as 177 cm, well above the 97th centile for girls. However, she is advanced in bone age, which lessens her chances of being abnormally tall at maturity. Her birth-weight was 4250 g (+1·6 SD); pregnancy was complicated by pre-eclamptic toxaemia, delivery was normal. She was always large, but of perfectly normal appearance and behaviour.

Her height (Fig. 1) and height velocity (Fig. 2) curves show the expected course. Height velocity is at first high, but soon falls to the 50th centile. Peak velocity is reached 2·2 years early, in fair agreement with menarche, which is 1·7 years early. Breast and pubic hair development are also at the 97th centile for timing.

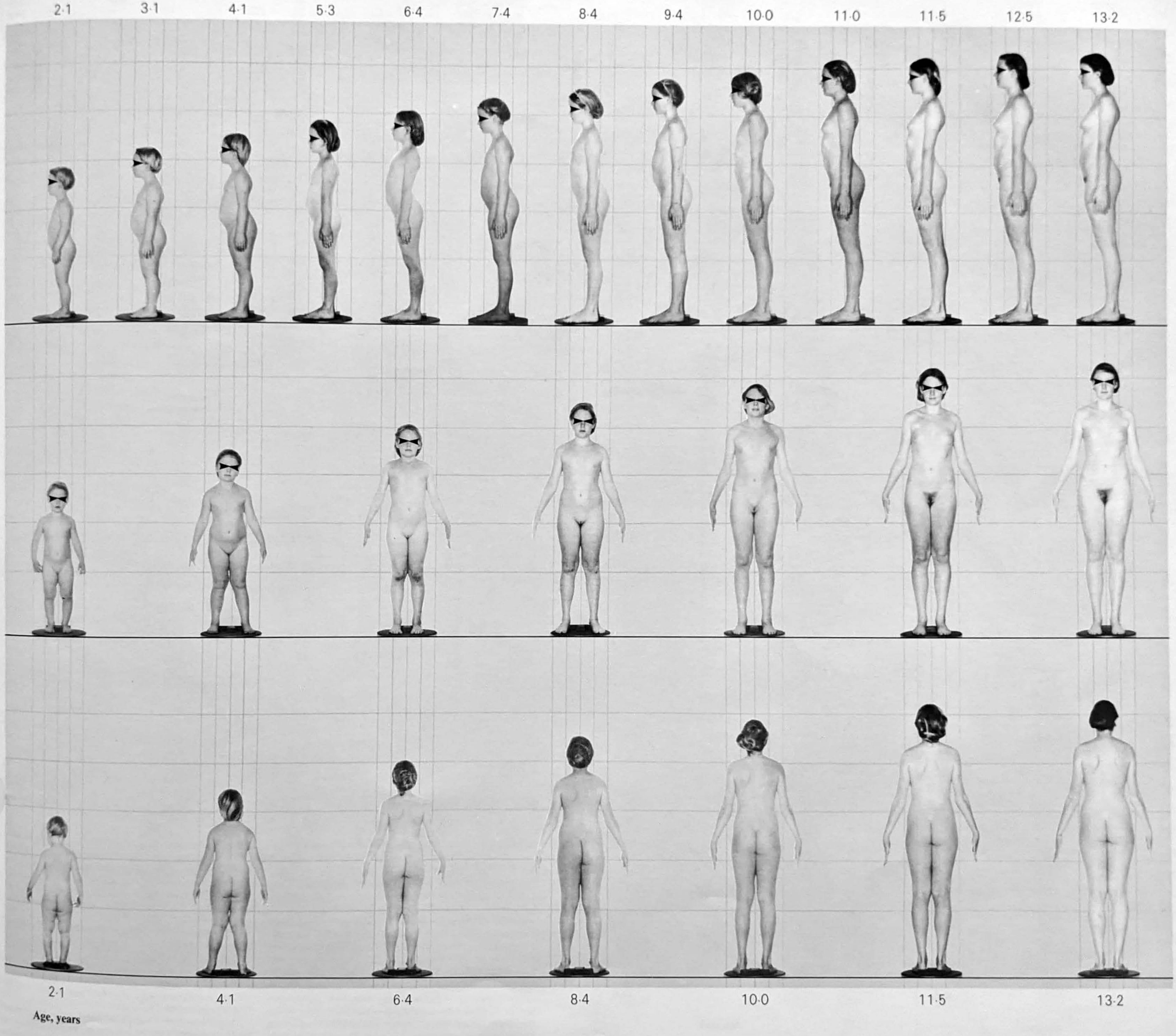
No treatment was given. The predicted adult height remained between 178 cm and 181 cm from age 2 to age 12·5 and dropped to 176 cm at age 13·2. This subject will be just within the parental target range but at its upper end, just as the Growth Delay subjects tend to be at the lower end.

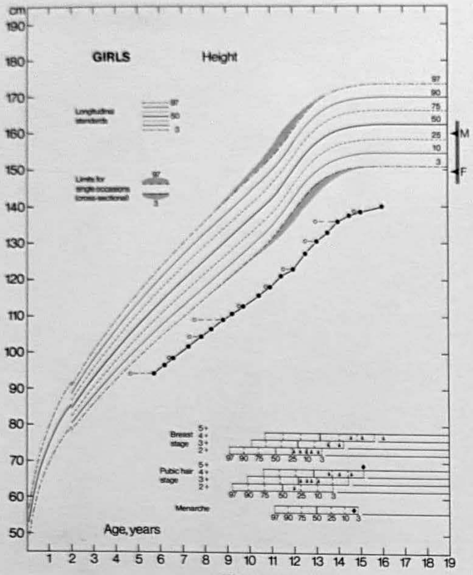
Legs and trunk are in nearly average proportion. The legs have an unusually marked spurt and end at about +2·3 SD compared with +1·9 SD for sitting height (Fig. 3), a relationship well within normal limits.

Biacromial (Fig. 7) and biiliac (Fig. 8) diameters are at first much above the 97th but will end at about the 75th and 50th respectively. The skinfold (Fig. 5) shows the pubertal decrease followed by a subsequent rise. Skeletal maturity (Fig. 6) is within normal limits, varying between the 50th and the 97th.

The pictures show a rather plump girl, whose knock knees gradually straighten at puberty. She is a large girl of fairly central somatotype, and not predominantly ectomorphic as are most persons of tall stature.

Subject No. 92





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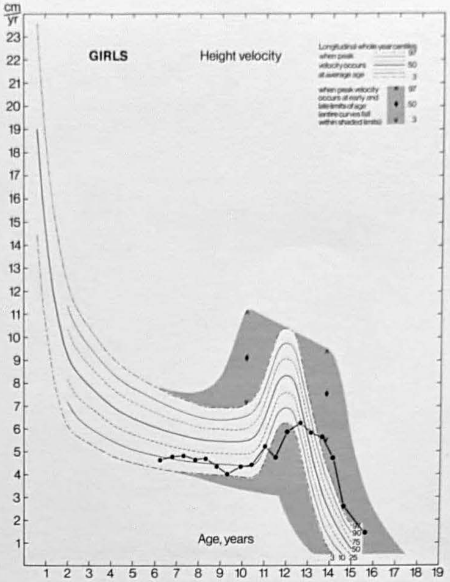

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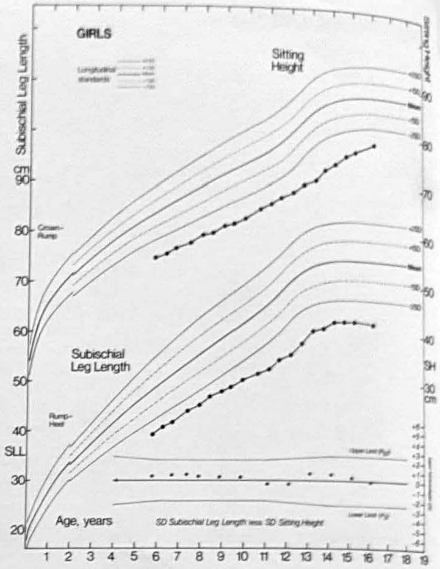

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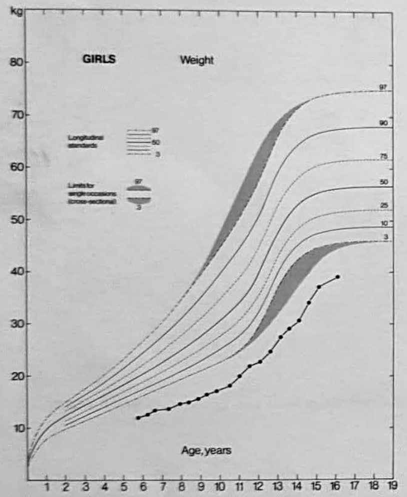

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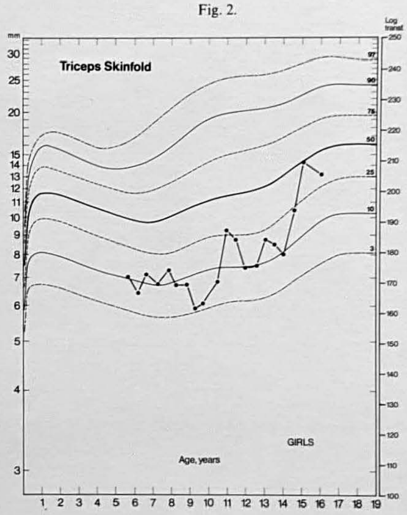

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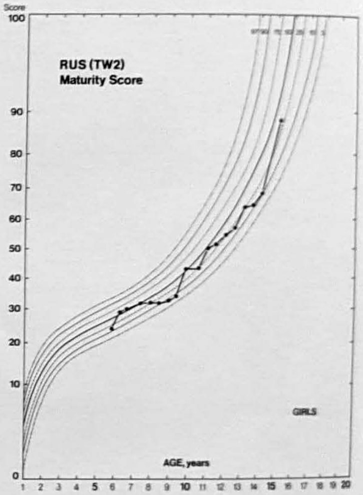

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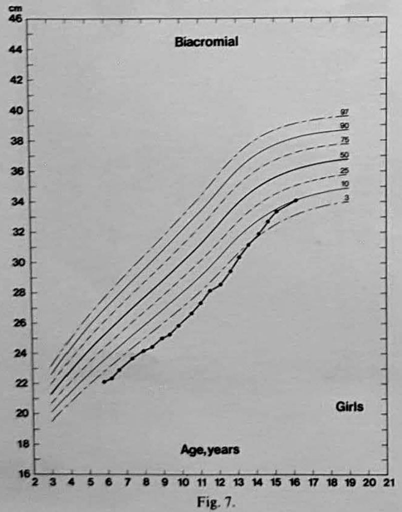

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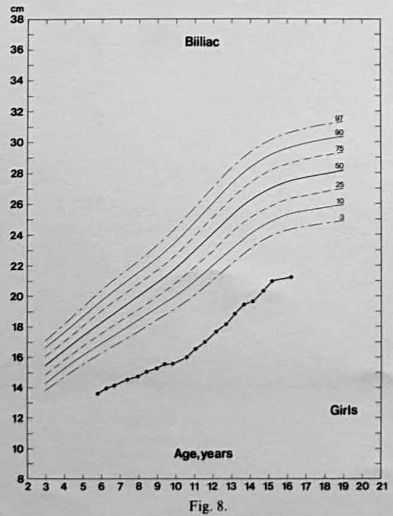


Fig. 8.

Silver–Russell Syndrome *Subject No. 93*

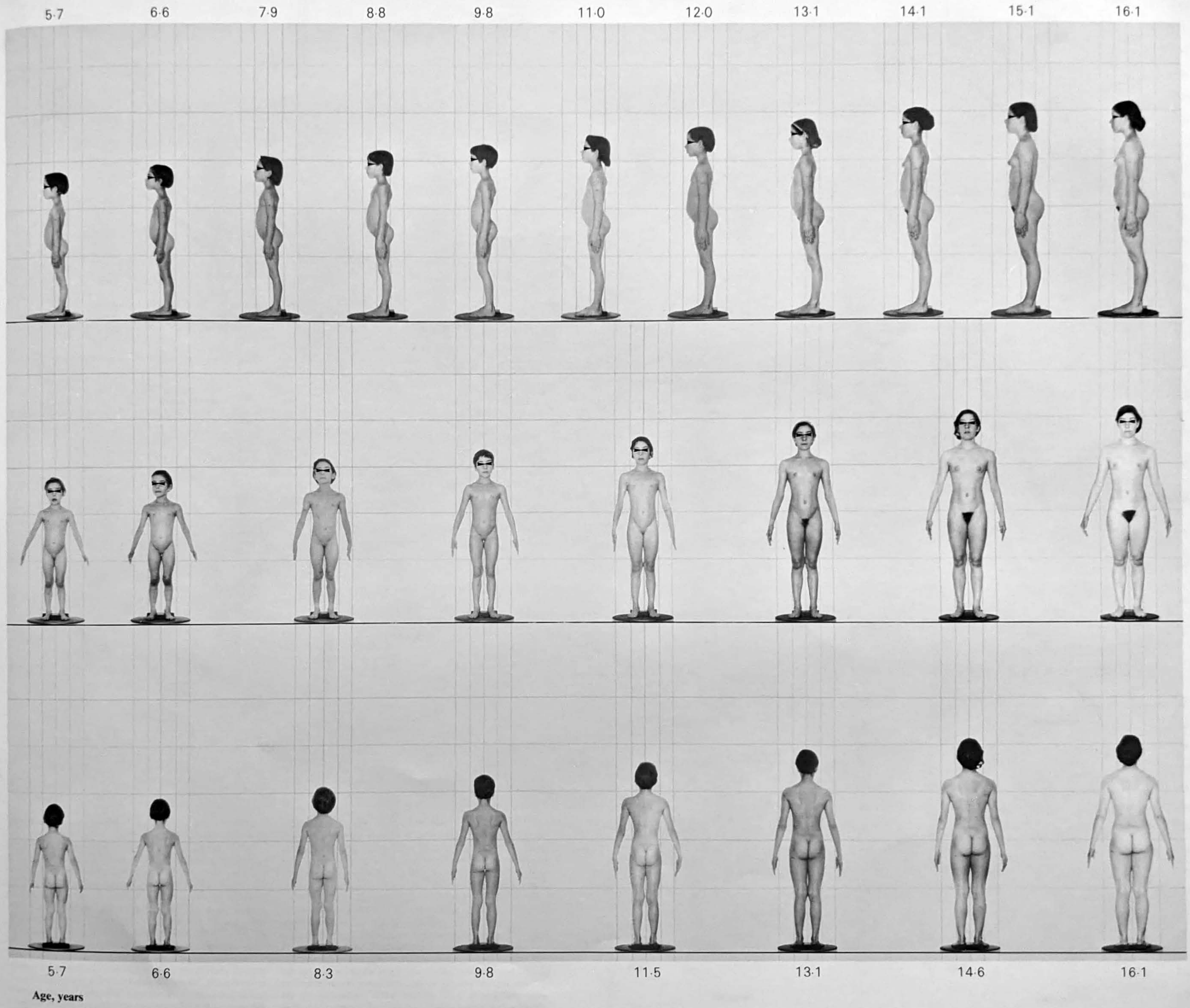
This subject is the first of two with Silver–Russell Syndrome, i.e. short stature associated with low birth-weight for length of gestation (Silver *et al.*, 1953; Russell, 1954; Tanner *et al.*, 1975a). The facial appearance is frequently very characteristic (see p. 168). Some children have asymmetry of limbs or trunk (Silver Syndrome) while others do not (Russell Syndrome).

Subject 93 was the first-born of two siblings. There had been two previous miscarriages due to toxaemia and this pregnancy was also toxaemic. The placenta showed an infarct. Pregnancy lasted 40 weeks, but birthweight was 1770 g—well below normal. Early feeding presented difficulties, as is usual in these patients, and the child was always small and thin.

Her height was 3·4 SD below the mean when she was first seen at the clinic, and it remained in much the same position throughout growth (Fig. 1). Height velocity (Fig. 2) was at the 10th centile before the adolescent spurt. The peak of the spurt only reached the 3rd centile, but the curve was broader than usual and so not much below average in total effect; it occurred slightly later than average. The development of breasts and pubic hair was also rather late, and menarche was near the 3rd centile in timing, unusual in this syndrome in which puberty is usually at the average age or slightly earlier. Although the parents were smaller than average (not usual in Silver–Russell Syndrome), the subject's final height is well below the parental target.

Sitting height and leg length (Fig. 3) are in average proportion. Biacromial diameter (Fig. 7) is relatively large and reaches the 10th centile, while biiliac (Fig. 8) is very small indeed. Weight (Fig. 4) is at the same relative position as height. Triceps skinfold (Fig. 5) is initially at the 10th but rises and ends around the 25th, a usual progression in these subjects. Skeletal maturity (Fig. 6) is around the 25th centile.

The pictures show a fairly typical appearance, especially at the younger ages. There is little sign of asymmetry. The wide shoulders and strongly mesomorphic build is unusual in the syndrome.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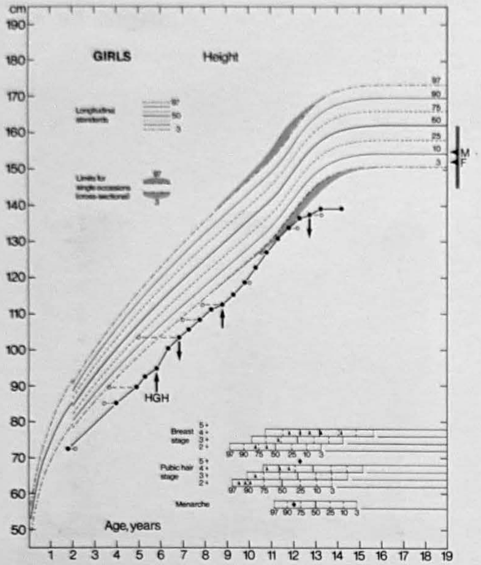
Age, years



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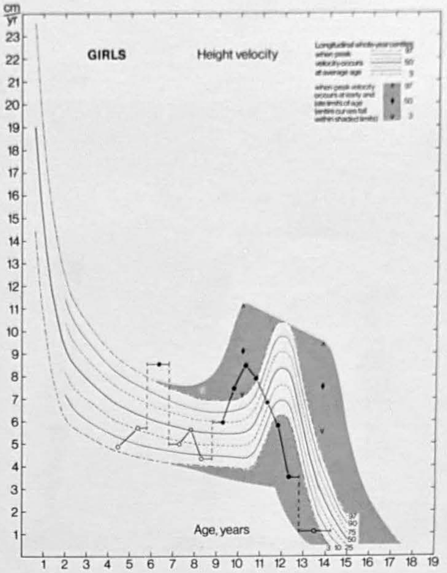

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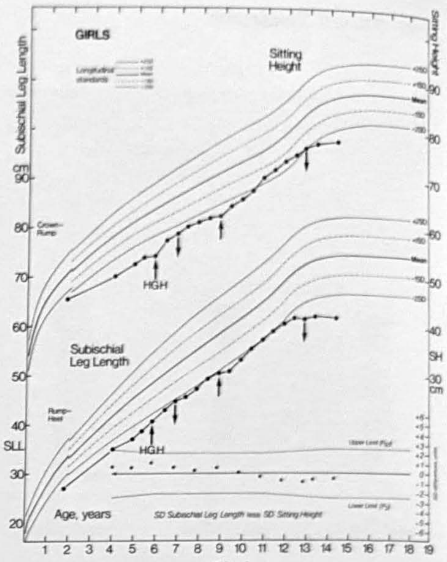

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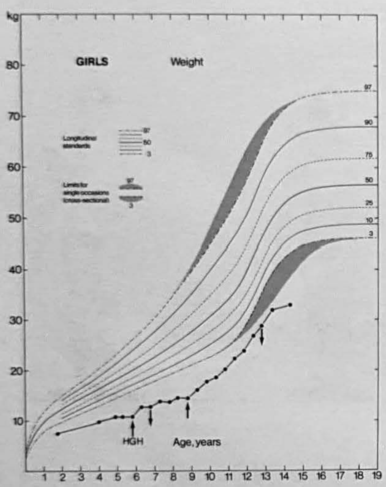

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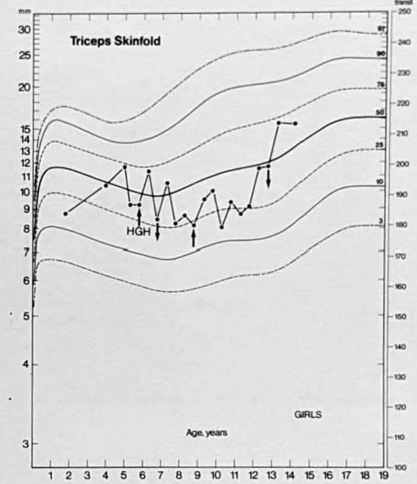

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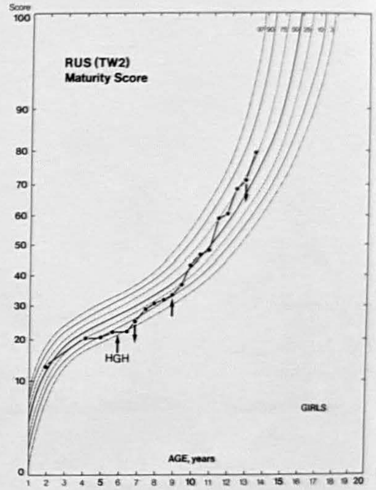

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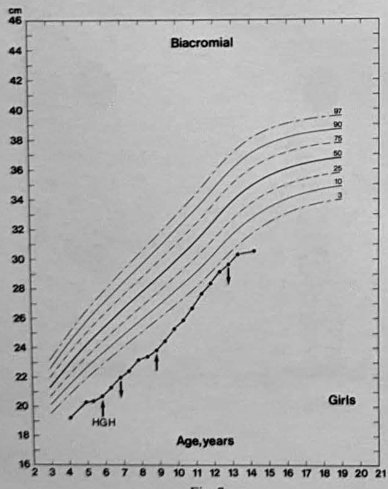


Fig. 7.

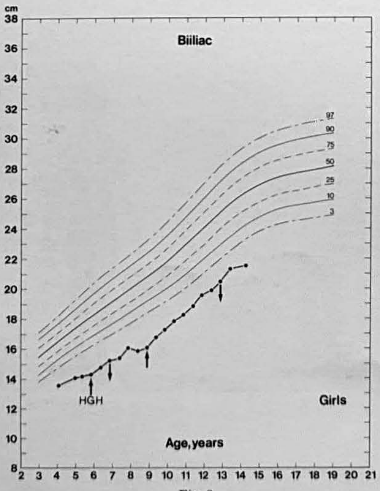


Fig. 8.

Silver–Russell Syndrome

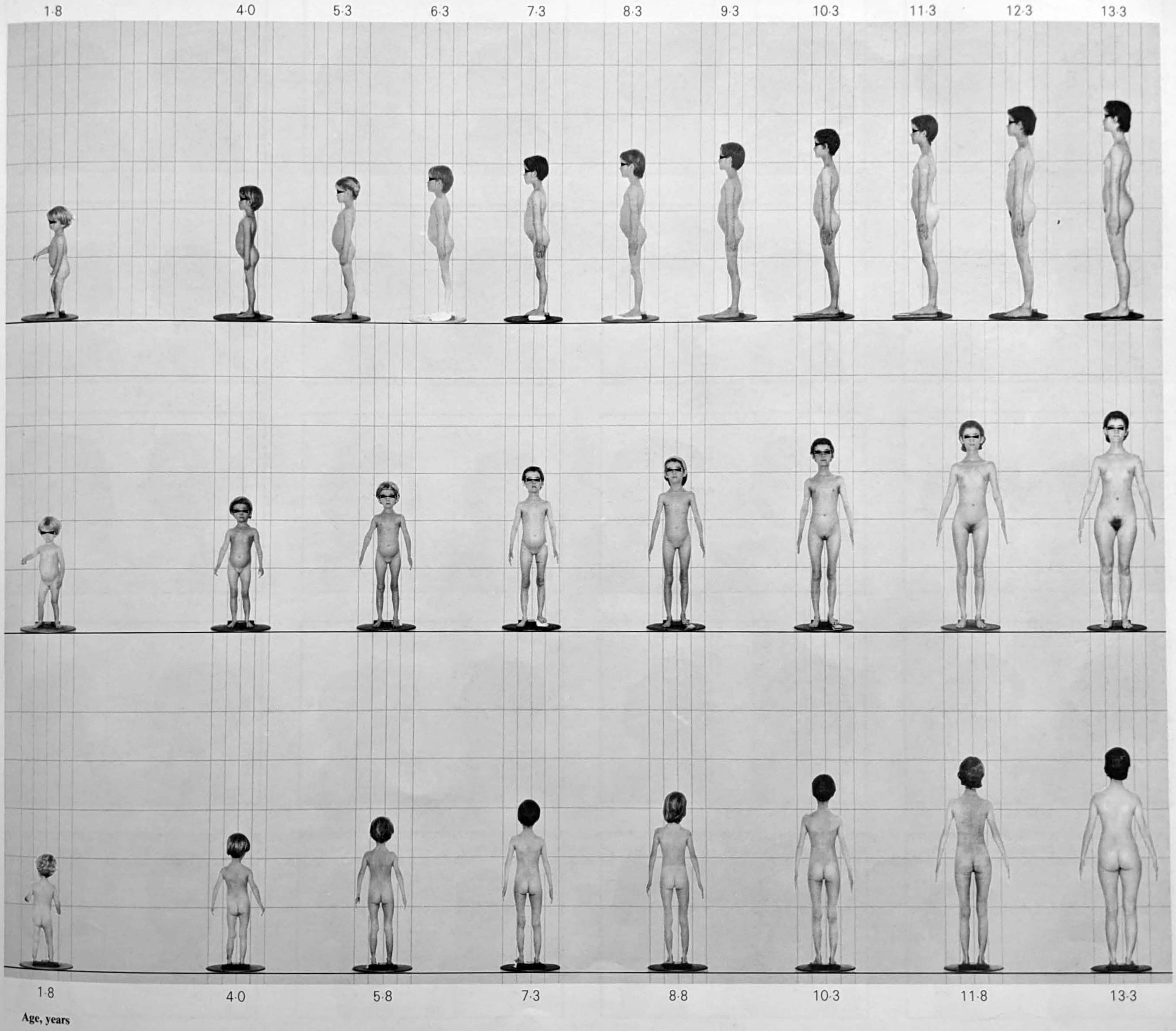
Subject No. 94

A second subject with Silver–Russell Syndrome, this time with marked asymmetry, especially of the legs (Silver Syndrome). Birthweight was 1760 g at 41 weeks (−3·1 SD) following an apparently normal pregnancy and an uneventful delivery. Her parents were small, like the previous subject's, but her final height was still considerably below the parental target.

Her height and height velocity curves (Figs 1 and 2) are somewhat confused by the effect of a trial of Human Growth Hormone (20 IU/week) on her growth. During the first period of administration her height velocity increased significantly from the 10th centile to above the 97th. When the hormone was discontinued it fell again to around the 10th centile. Accordingly, growth hormone was given again for a longer period, but the response was complicated by the coincidental occurrence of the adolescent growth spurt. Height briefly approaches the 3rd centile but only because of the earliness of the spurt. It is hard to say in this subject whether the hormone did any good or not; in most cases we have treated it was clearly without effect. Breasts and pubic hair developed relatively early and menarche was at 12·0 years (+1·0 SD).

Sitting height and leg length (Fig. 3) are in near-average proportion initially. The leg length spurt is small so that at maturity sitting height is relatively preponderant. Biacromial diameter (Fig. 7) is relatively a little larger than biiliac (Fig. 8), though both are very small. Weight (Fig. 4) is below the 3rd centile. Triceps skinfold (Fig. 5) is larger initially than in most such patients, falls to the 25th and then rises after puberty to above the 50th. Skeletal maturity (Fig. 6) is at first below average but then reaches the 75th centile.

The pictures show a very typical face and trunk. The right leg is much longer than the left, as can be seen in the second picture. In the 3rd, 4th, 5th and 6th pictures a pad is placed under the left foot to straighten up the stance. The last two pictures are taken without this. In the last picture, the degree of asymmetry seems to have diminished, or, if not, the subject has succeeded very well in accommodating it by postural adjustment.



1·8
4·0
5·3
6·3
7·3
8·3
9·3
10·3
11·3
12·3
13·3
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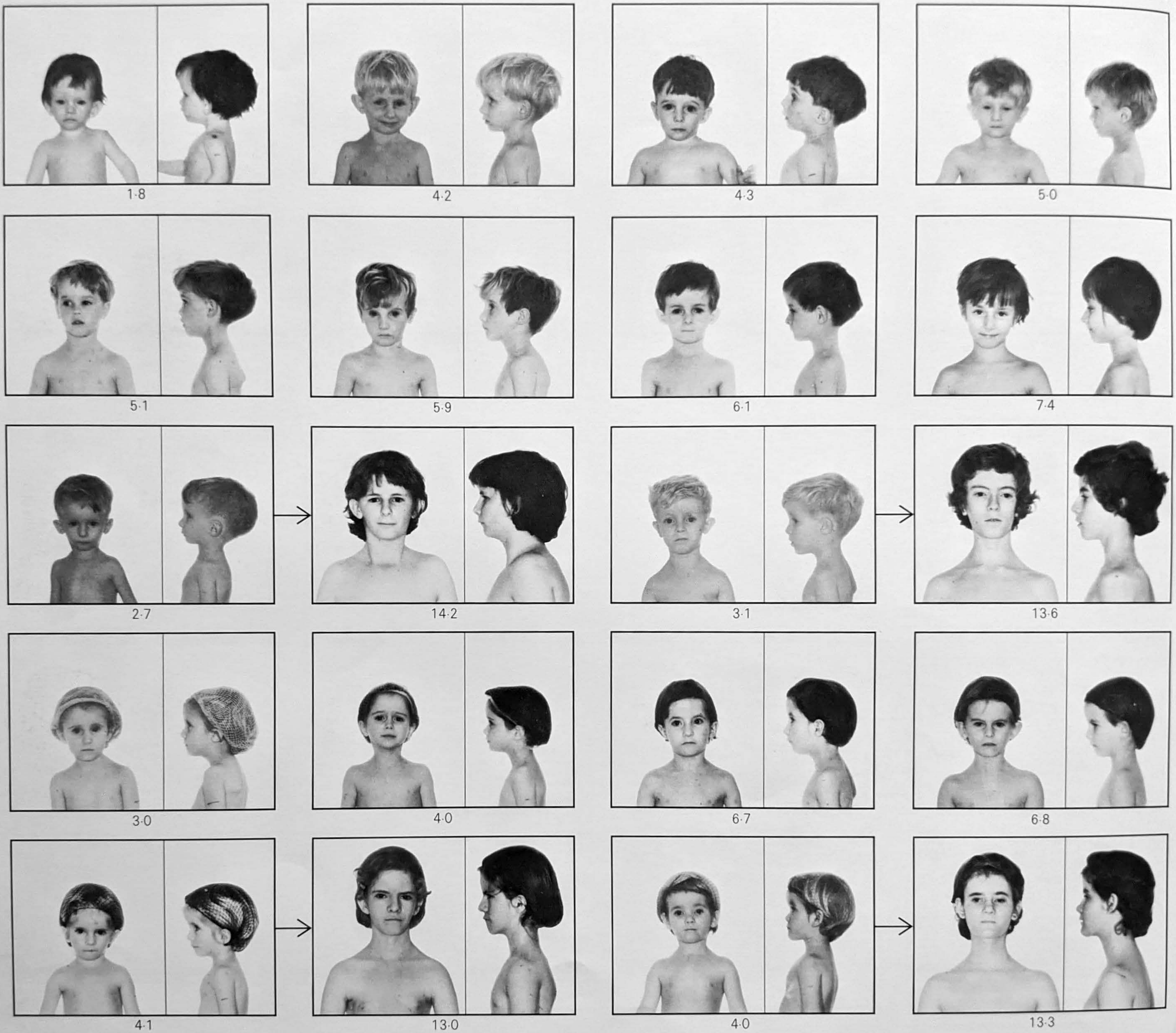
11·8
13·3
Age, years



1·8 4·2 4·3 5·0

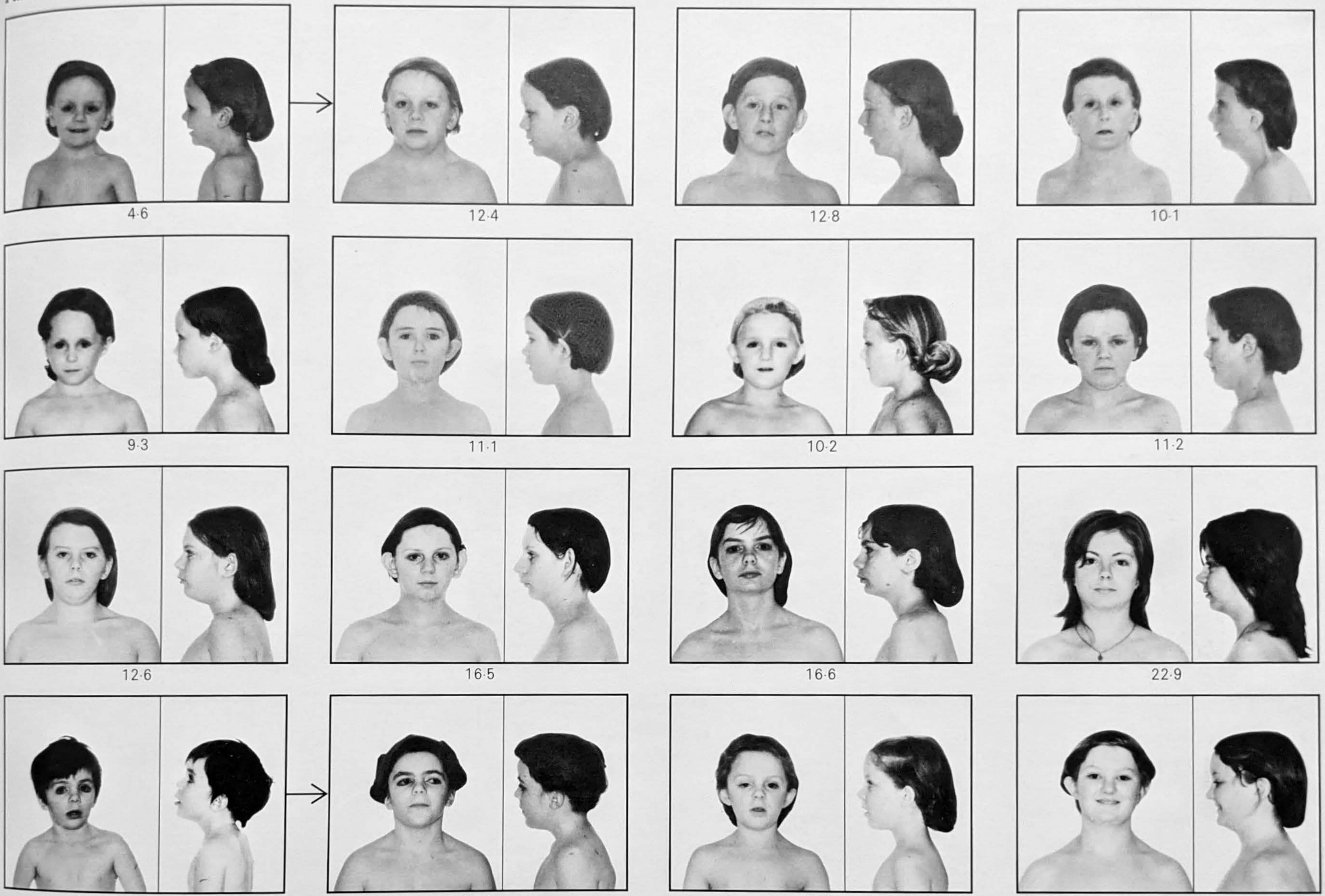
5·1 5·9 6·1 7·4

2·7 14·2 3·1 13·6

3·0 4·0 6·7 6·8

4·1 13·0 4·0 13·3

The faces of ten boys and six girls with Silver–Russell Syndrome. The small triangular face, high forehead, relatively large cranium, low set ears and small mouth and jaw are characteristic. The corners of the mouth frequently turn down in the so-called "shark-mouth". The particular facial appearance is marked when the subjects are young but becomes considerably less noticeable by the time of adolescence. This is demonstrated in the four sets of pictures of the same child at two ages, indicated by the arrows.



4·6 12·4 12·8 10·1

9·3 11·1 10·2 11·2

12·6 16·5 16·6 22·9

3·5 10·1 8·6 16·6

The face in Turner's Syndrome is frequently recognizable, though by more subtle characteristics than the Silver–Russell Syndrome face. The top three rows show subjects all with the karyotype 45 XO. The subjects in the bottom row are mosaics, the first having an isochromosome, karyotype 45 XO/46 Xi (Xq) and the second and third being ordinary mosaics, karyotype 45 XO/46 XX. Verbal description of the gestalt constituted by the human face is notoriously difficult and it is perhaps easier to internalize the visual stimuli of the photographs. The nose is usually broad and often has upturned nostrils; the eyes seem to be set close together and are rather large, sometimes with inner canthal folds; the ears are large and often prominent, the jaw is small. The chest and shoulders are usually wide (first subject, third row is a good example), which causes the nipples to appear to be widely spaced. (Ages are given in years; arrows indicate two sets of pictures of the same child.)

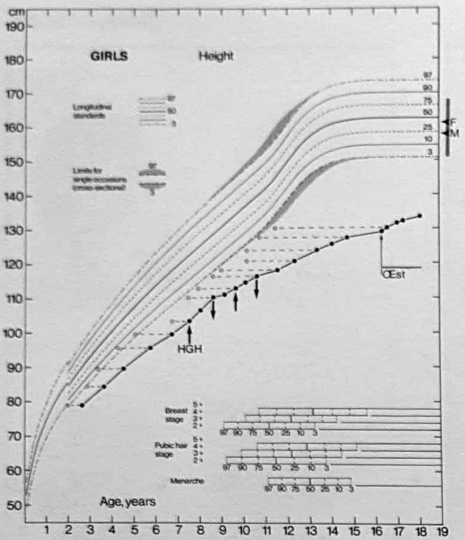


Fig. 1.

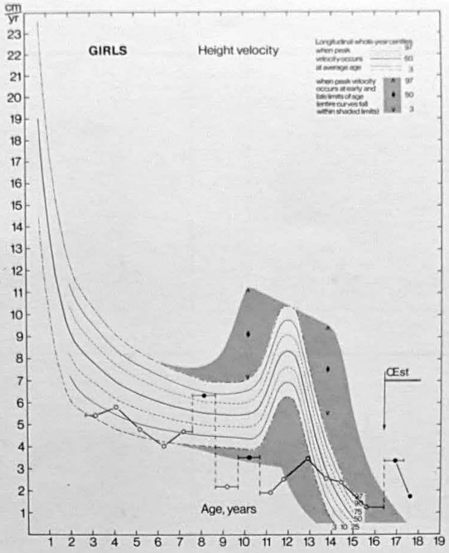


Fig. 2.

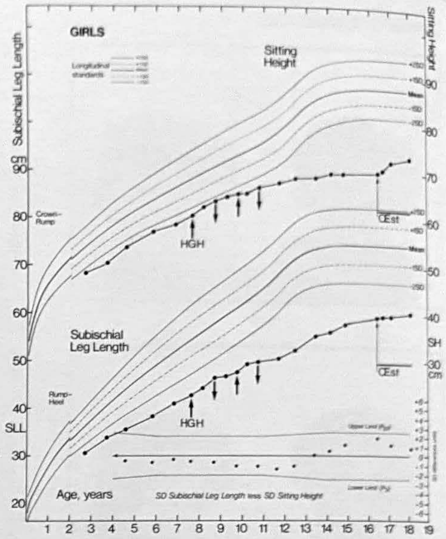


Fig. 3.

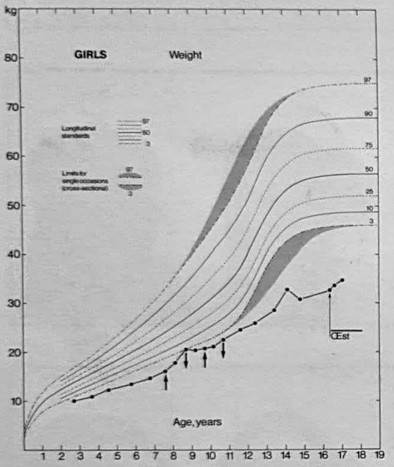


Fig. 4.

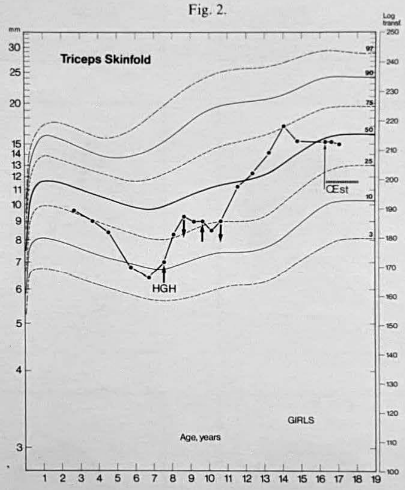


Fig. 5.

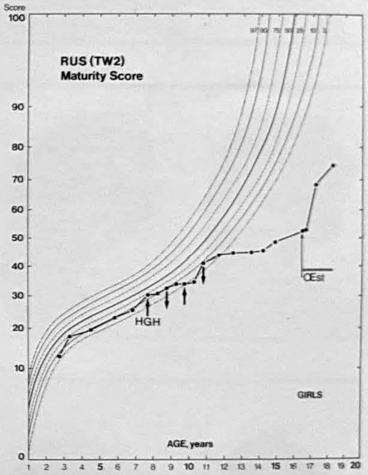


Fig. 6.

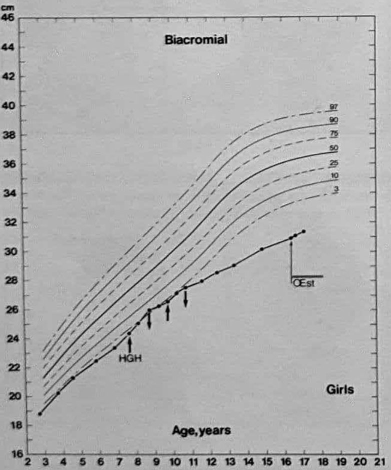


Fig. 7.

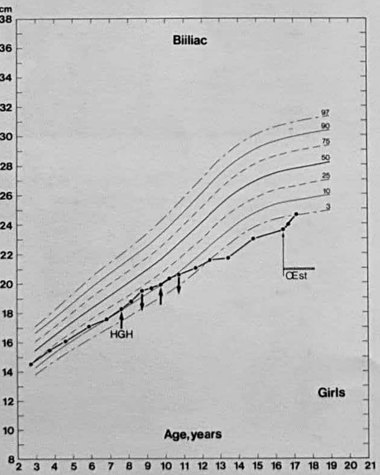


Fig. 8.

Turner's Syndrome

Subject No. 95

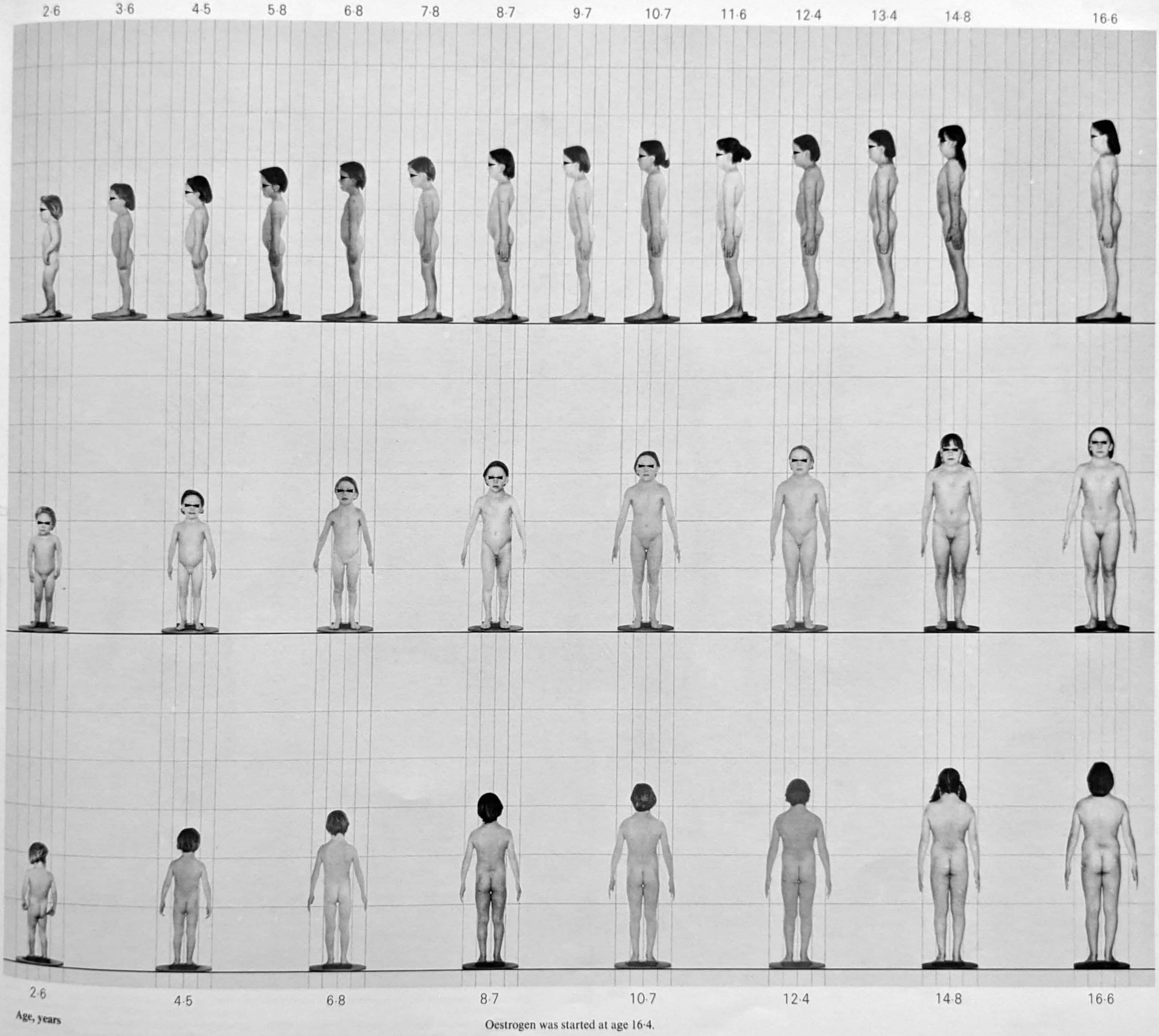
The first of two subjects with Turner's Syndrome, karyotype XO. Birthweight was 2950 g (−0·8 SD), which is a little above average for this syndrome. Pregnancy and delivery were uneventful. The height curve (Fig. 1) shows growth falling steadily further and further away from normal, due to a height velocity (Fig. 2) consistently at about the 3rd to 10th centile, which is typical. Administration of Human Growth Hormone caused an increase in height velocity, but of minor proportions, offset by the excessively low velocity in the year following cessation of the treatment. These subjects do not have a lack of growth hormone and the physiological reason for their short stature is unknown. No significant adolescent height spurt occurs (Brook *et al.*, 1974), but growth continues for somewhat longer than in the normal girl, in whom it is shut off, so to speak, by the adolescent growth spurt. There is a small spurt in height, not always seen, when ethinyl oestradiol treatment is started at 16·4. Normally this treatment would be started earlier, but in this subject there were occupational reasons for delaying it. Final height is 134 cm, a little below average for the syndrome. This reflects the rather surprising fact that the child-parent correlation of adult height is preserved in the syndrome (Brook *et al.*, 1977) and the parents were of below-average height.

Sitting height and leg length (Fig. 3) are at first reduced to about the same degree. Up to age 13 sitting height is relatively the larger, but leg length grows for a longer time and in the end the SD scores are nearly the same. It is sitting height not leg length that apparently responds to oestrogen administration, and it seems unlikely that this represents simply an accumulation of fat on the buttocks.

Biacromial diameter (Fig. 7) is reduced; biiliac diameter (Fig. 8) is throughout a little larger and starts at the 25th centile. It is increased significantly by the oestradiol. Weight (Fig. 4) is similar to height. Triceps skinfold (Fig. 5) increases when growth hormone is first given, in contrast to what occurs in growth hormone deficient children. In this girl oestradiol has little effect on weight or skinfold.

Skeletal maturity (Fig. 6) is at first between the 10th and 25th centiles, but fails to advance much after a bone age of about 10 "years" until oestrogen is given, when a large advance occurs.

The pictures show a well-marked and immediately recognizable appearance of Turner's Syndrome. Treatment with oestrogen began 0·2 years before the last picture.



Oestrogen was started at age 16·4.

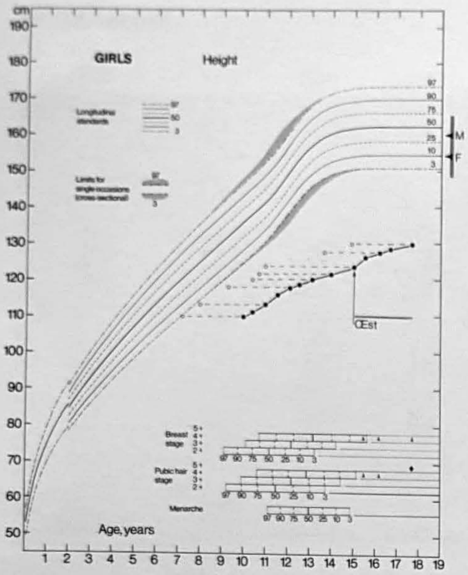


Fig. 1.

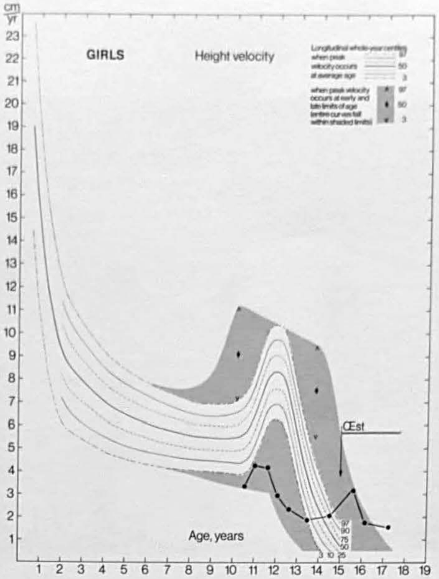


Fig. 2.

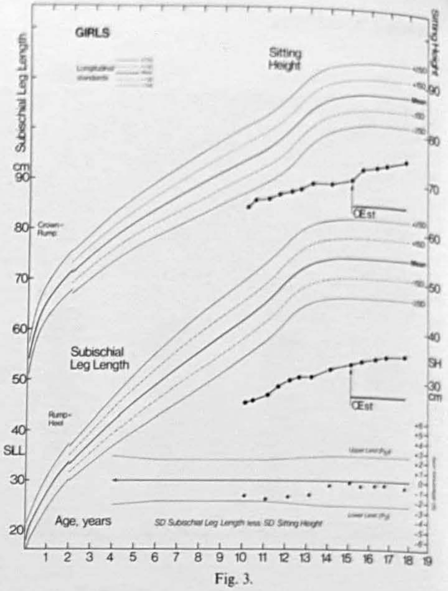


Fig. 3.

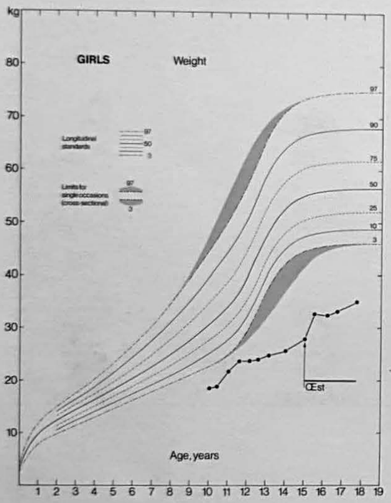


Fig. 4.

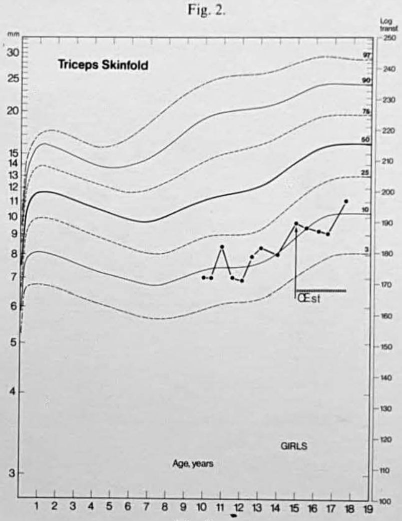


Fig. 5.

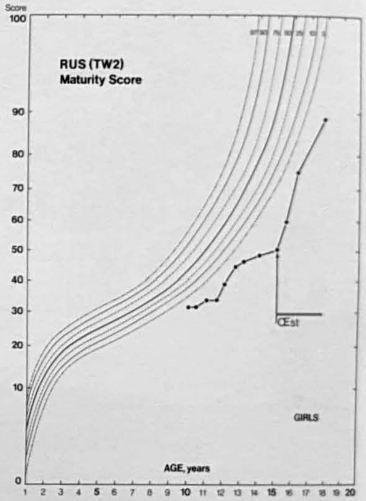


Fig. 6.

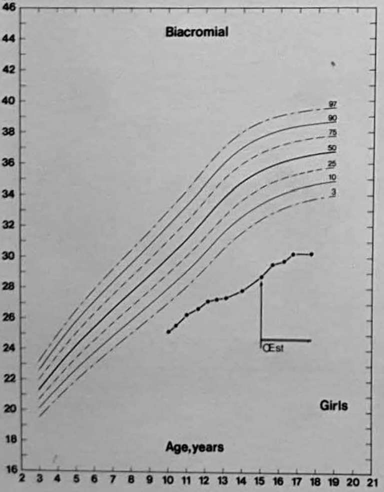


Fig. 7.

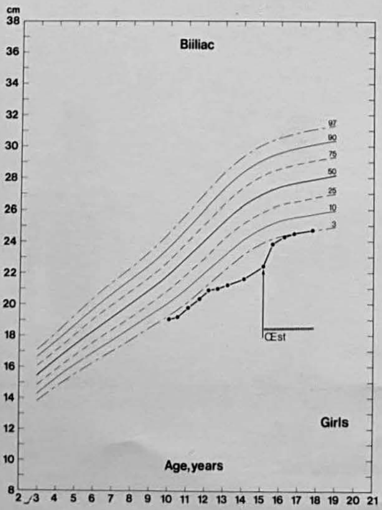


Fig. 8.

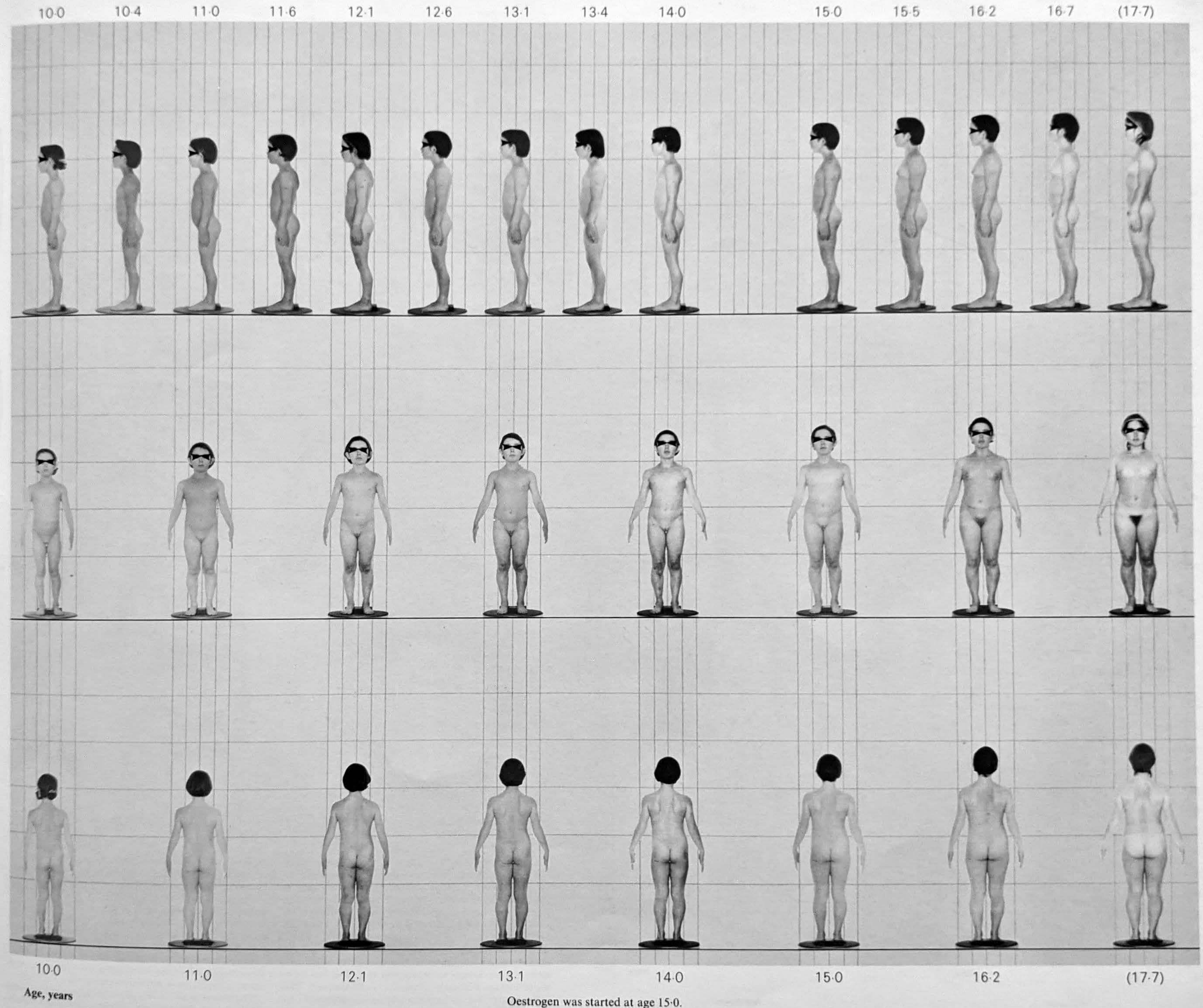
Turner's Syndrome

Subject No. 96

A second subject with Turner's Syndrome, karyotype XO. Her birth-weight, unusually, was average. Her height (Fig. 1) and height velocity (Fig. 2) curves are similar to those of the preceding subject. Growth hormone treatment (not shown) was tried for a year with very little effect. There was no adolescent growth spurt and oestradiol caused a very minor increase in height velocity (entirely in sitting height, as in the previous subject). In this subject the trunk is relatively less shortened than the legs between 10 and 12 years but at 17 the proportions are near to average.

Biacromial diameter (Fig. 7) is very small throughout. Biiliac diameter (Fig. 8) is relatively larger and a distinct increase in velocity is caused by oestradiol, as in the preceding subject. Some weight increase is caused by the oestrogen (Fig. 4), but no significant change in skinfolds (Fig. 5). Skeletal maturity (Fig. 6) was already below the 3rd centile when the subject was first seen; it continues to advance a little but at a much slower rate than normal until oestrogens are given.

The pictures show the usual Turner's Syndrome, though less typically than in the preceding subject. Oestrogen is begun at age 15·0 and is responsible for the breasts and pubic hair seen in the subsequent pictures. Girls with the syndrome sometimes develop pubic hair spontaneously. Although it is usually sparse and of an appearance and distribution rather characteristic of the syndrome, it may nevertheless spread to cover the normal stage 5 area. In other patients it appears only when oestrogens are administered, and in some it never appears at all, despite oestrogens.



Oestrogen was started at age 15·0.

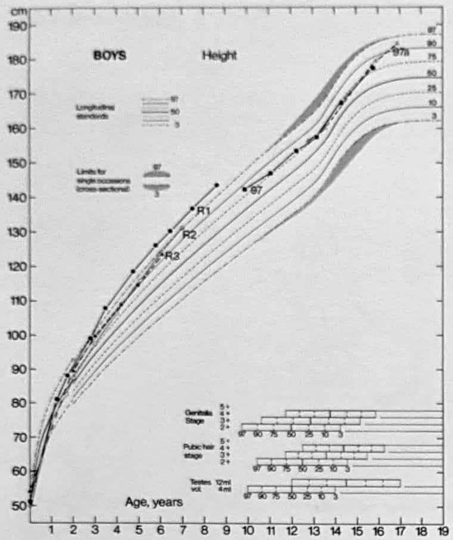


Fig. 1.

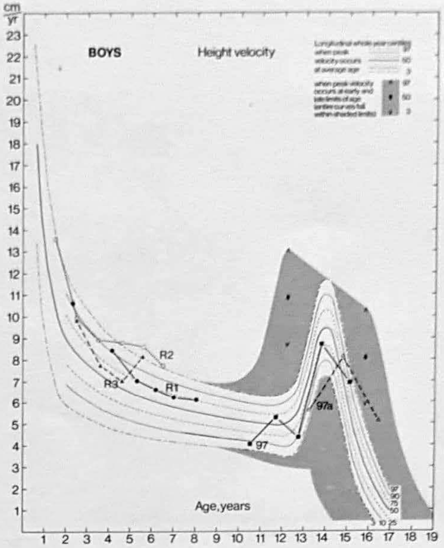


Fig. 2.

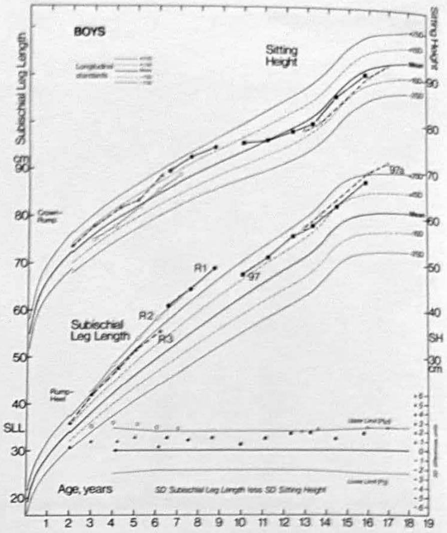


Fig. 3.

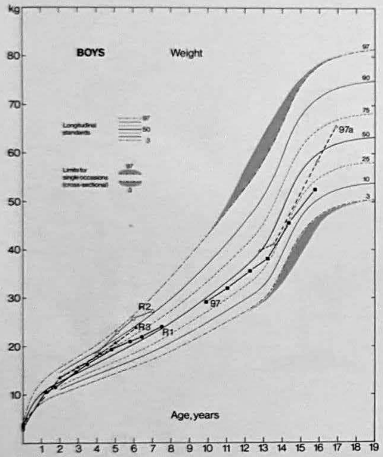


Fig. 4.

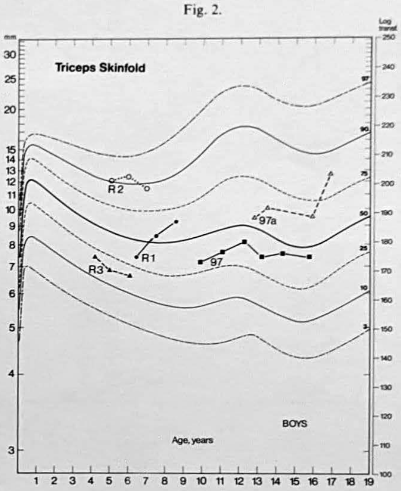


Fig. 5.

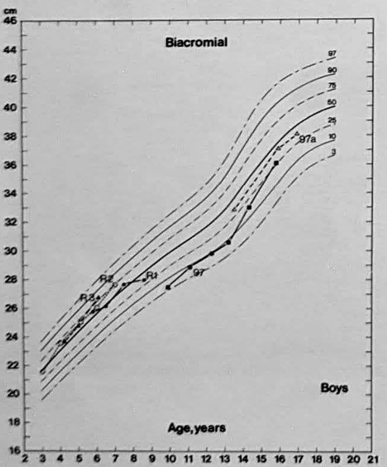


Fig. 6.

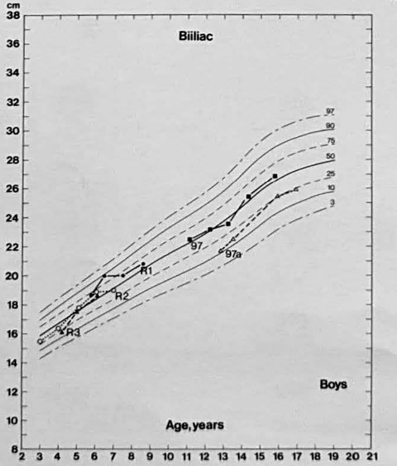


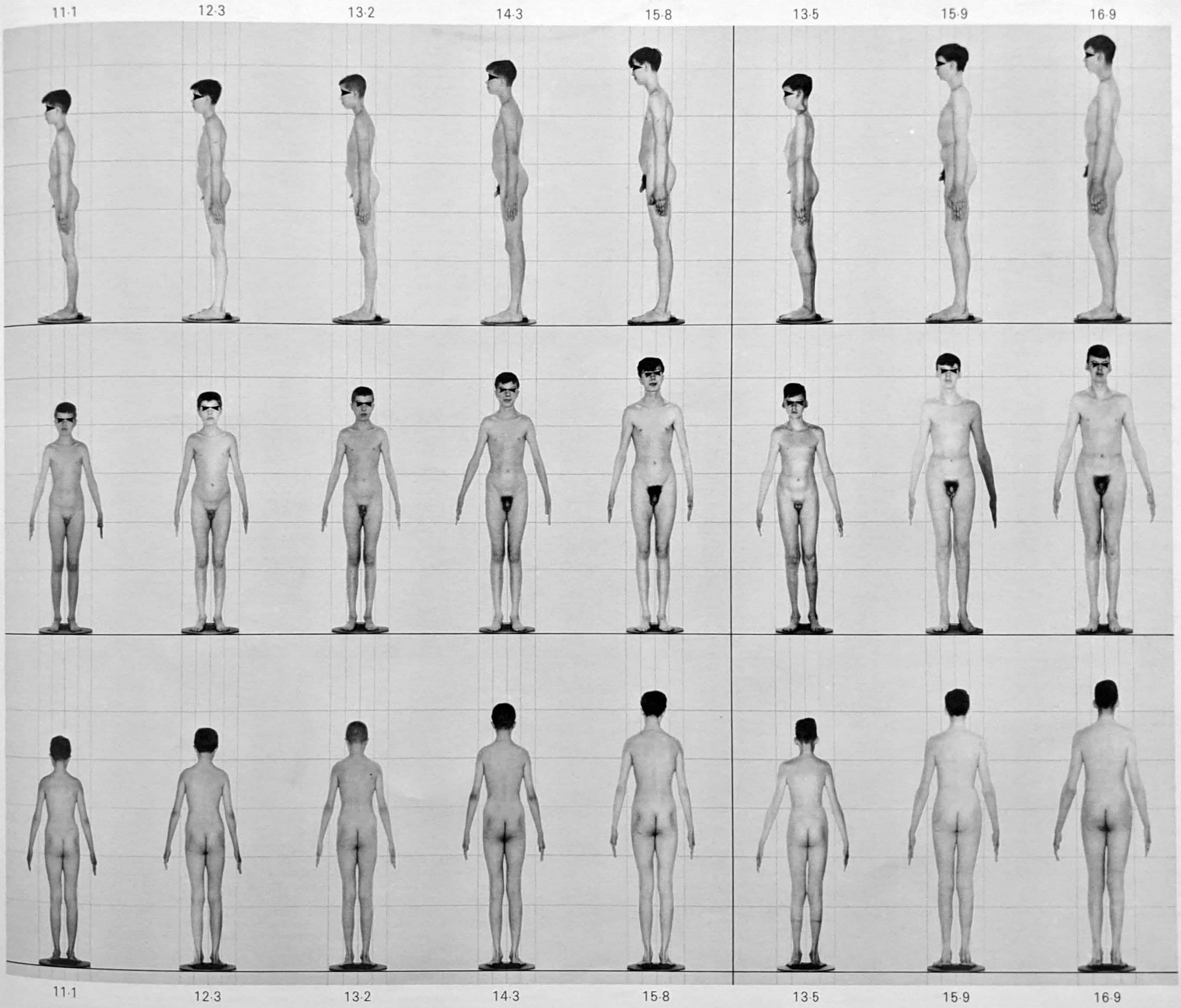
Fig. 7.

Klinefelter's Syndrome *Subjects Nos R1, R2, R3, 97 and 97a*

Five subjects with Klinefelter's Syndrome, all karyotype XXY. Three of them (R1, R2, R3; charts only) are by courtesy of Dr Shirley Ratcliffe of the Cytogenetics Unit, University of Edinburgh, where they were diagnosed during routine karyotyping of neonates; measurements are by Dr Ratcliffe. The height curves (Fig. 1) of R1–R3 show a steady increase through the centiles; most adults with the syndrome are over the 90th. Height velocities (Fig. 2) are correspondingly high. The legs are relatively longer than the trunk, even from the earliest reliable measurements. Subject no. R2 is above the +2SD line for leg length from age 3 onwards, and subject no. R3 close to it. Their sitting heights (Fig. 3) are about average (no. R2) and +1 SD (no. R3). When sitting height was first measured in subject R1, at age 6·4, it was at about +1·5 SD, whereas leg length was at +2·7 SD. All three subjects have SD differences above the median; no. R2's difference is outside the normal limits (though not increasing with age). Nos 97 and 97a also are at the upper limit of leg length for sitting height.

Biacromial diameters (Fig. 6) of R1–R3 are a little above average, corresponding, more or less, to sitting height (and therefore being low for overall stature). The same is true of the biiliac diameters (Fig. 7); nos R1 and 97 have relatively high biiliacs for their biacromial diameters but nos R2, R3 and 97a have the reverse. Weight (Fig. 4) is further above the mean than sitting height, and triceps skinfold (Fig. 5) is high in two out of the five subjects, low in two and average in one.

The pictures (nos 97 and 97a) show the characteristic physique associated with this syndrome, with long legs and lack of body muscle. The testes are small in no. 97, but not particularly so in no. 97a.



Age, years

Subject no. 97.

Subject no. 97a.

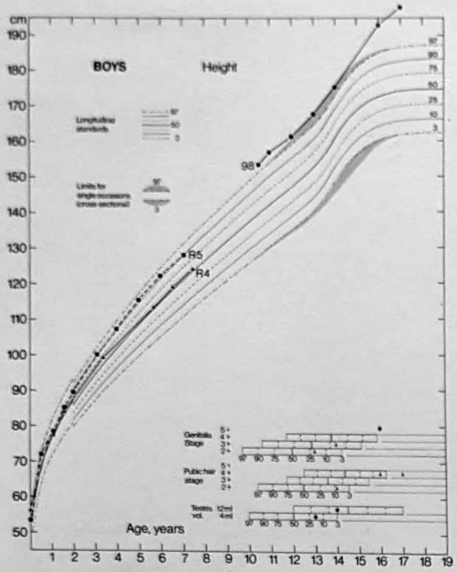


Fig. 1.

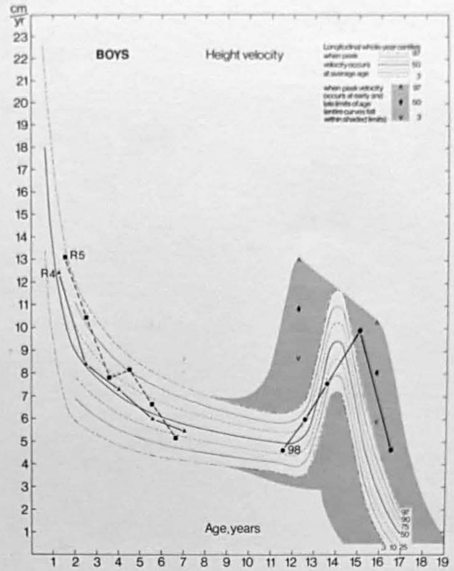


Fig. 2.

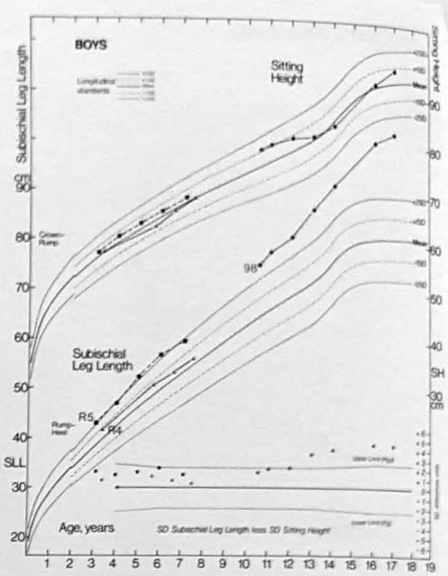


Fig. 3.

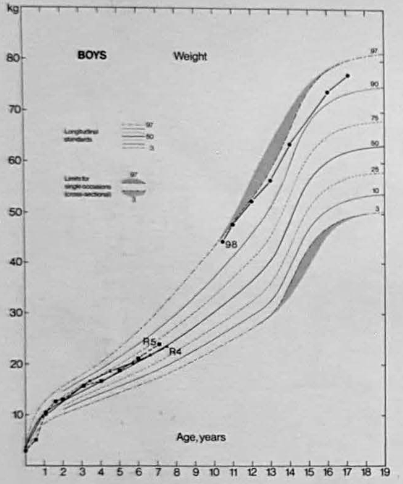


Fig. 4.

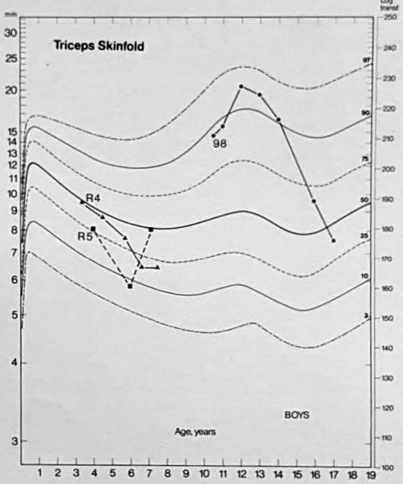


Fig. 5.

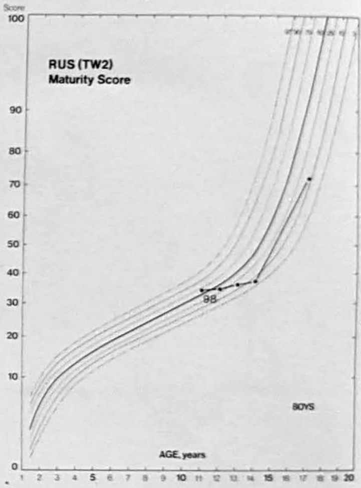
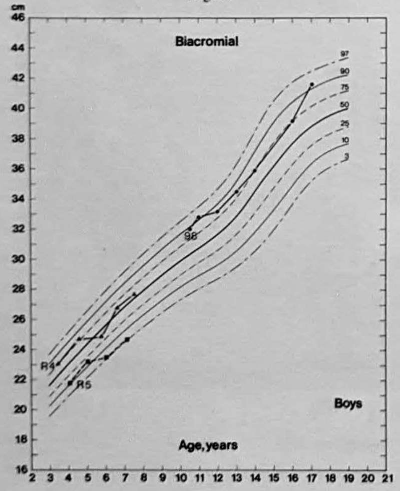


Fig. 6.



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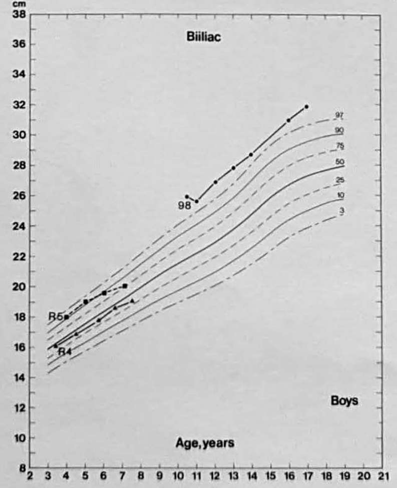


Fig. 8.

XYY Syndrome

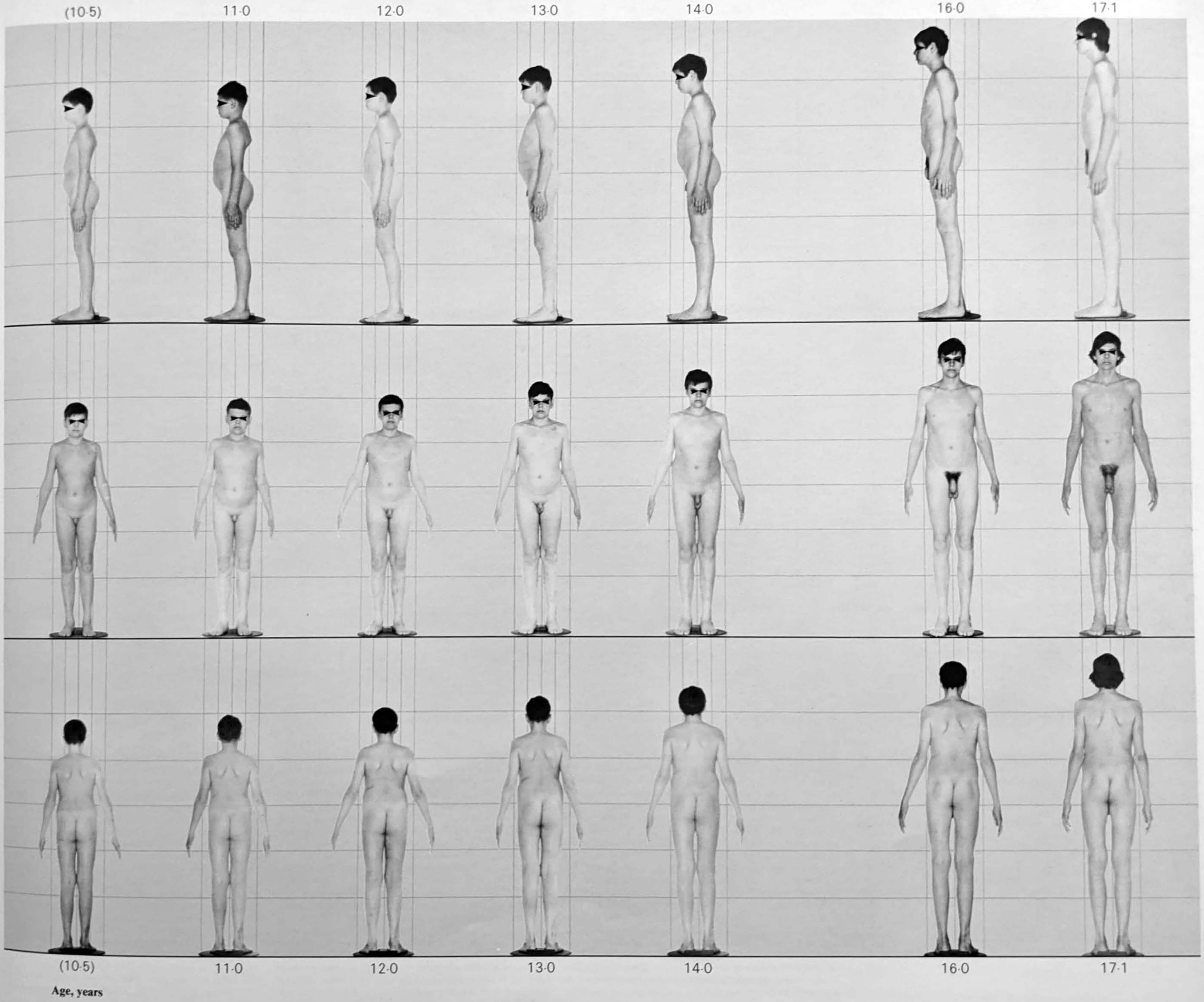
Subjects Nos 98, R4 and R5.

Three subjects with XYY Syndrome; the measurements of nos R4 and R5 (charts only) are given by courtesy of Dr Shirley Ratcliffe (see p. 174) who studied their growth from birth onwards. No. R5 is already tall by age 2 (Fig. 1), and continues to become relatively taller, with a height velocity (Fig. 2) at or over the 90th centile at least until age 6. The other subject, no. 98, is also tall. He is just above the 97th centile until puberty and then, by virtue of a larger than usual adolescent spurt, attains (or will undoubtedly attain) a height of 2 metres (6' 7"). Subject no. R4 is only of average height, however, making the point that the XYY range extends from about the 50th to well above the 97th. The excessive height is almost entirely in leg length, with legs near the upper limits for sitting height in no. R5 and above it in no. 98. Sitting height (Fig. 3) is average or not greatly above it. These proportions are already present by age 3, but seem to become still more pronounced at puberty, judging by the one subject presented here. This growth is the pattern of a low, not high, level of androgenic hormones, despite the chromosome formula. Indeed, growth is not unlike that of Klinefelter Syndrome subjects, who have low androgen outputs.

Biacromial diameter (Fig. 7) is low in one subject, average in a second and at the 90th centile in subject no. 98. In both nos 98 and R5 biiliac diameter (Fig. 8) is distinctly large in comparison with biacromial; in R4 the diameters are similar. Weight (Fig. 4) is average in nos R4 and R5 and at about the 97th in no. 98. Triceps skinfold (Fig. 5) is below average in the two younger subjects, above in no. 98.

Bone age (Fig. 6) in no. 98 was initially average, but then slowed down at the usual pre-puberty value; genitalia, pubic hair and testes size 4 ml were all delayed, and pubic hair failed to reach a full stage 5 by age 17.

The pictures of no. 98 show the characteristic physique of the XYY syndrome, with tallness due to long legs; the shoulders, at first narrow, increase at adolescence.


(10·5)
11·0
12·0
13·0
14·0
16·0
17·1
(10·5)
11·0
12·0
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16·0
17·1
Age, years

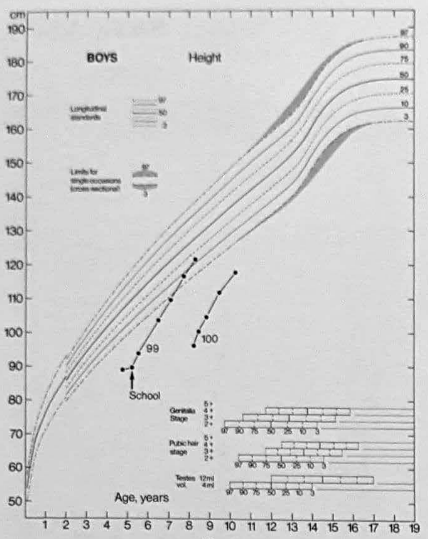


Fig. 1.

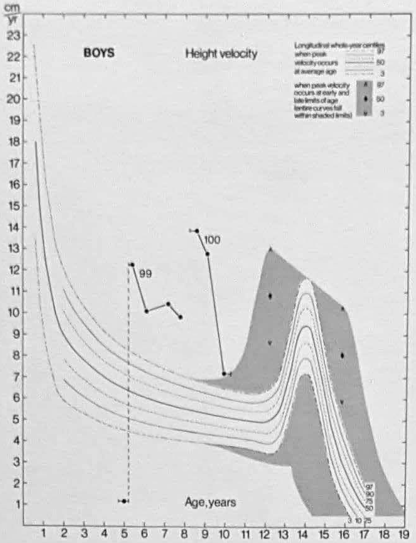


Fig. 2.

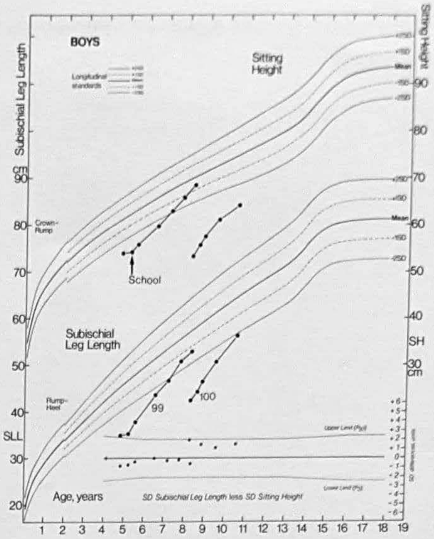


Fig. 3.

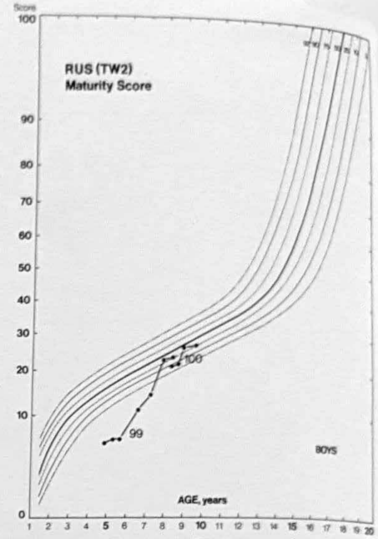


Fig. 4.

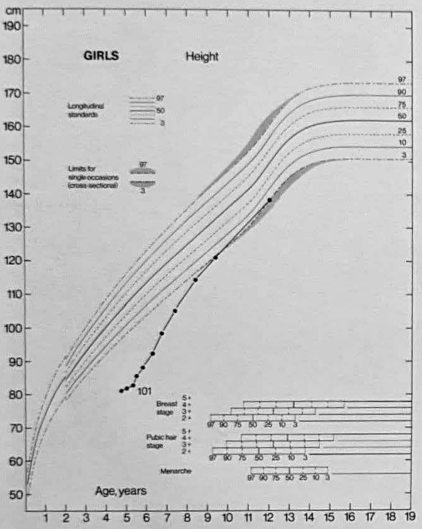


Fig. 5.

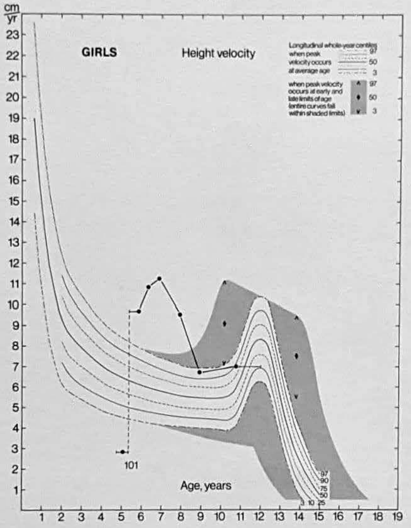


Fig. 6.

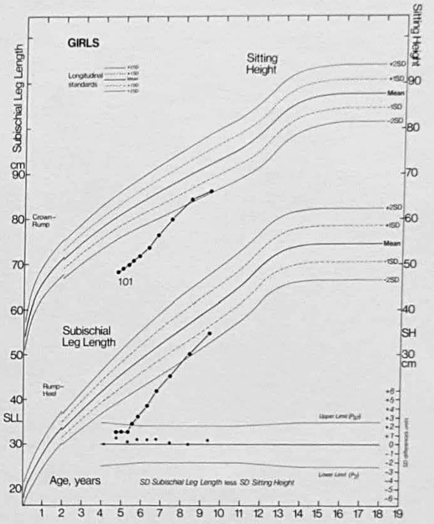


Fig. 7.

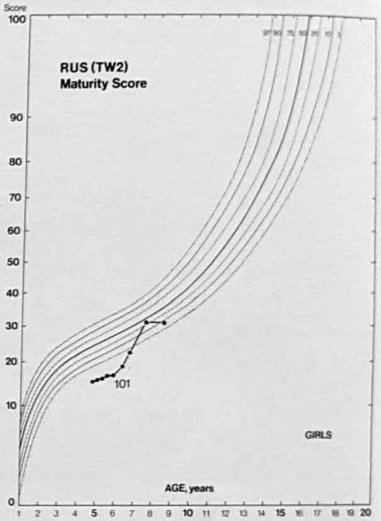


Fig. 8.

Short Stature Due to Psychosocial Stress with Catch-up on Change of Environment

Subjects Nos 99, 100 and 101

Figures 1–4 (top row) show results for subjects nos 99 and 100 (boys).

Figures 5–8 (bottom row) show results for subject no. 101 (a girl).

Three children (pictures of two only) with short stature associated with psychosocial problems (see Powell *et al.*, 1967).

Subject no. 99, a boy, was the third child out of four in a fireman's family. His mother brought him to the clinic with the complaint of short stature. He was born by Caesarian section because of antepartum haemorrage at what was thought to be 36 weeks gestation, and weighed 1810 g (−2·6SD). However, his appearance was not that of Silver-Russell Syndrome, and his mother admitted that his behaviour was different from that of her other children, in that he stole, "but only food, Doctor". His feeding pattern was grossly disturbed. At times he ate little and at others he ate voraciously, seemingly in quantitative competition with his 193 cm (6′ 4″) father. He was anxious and slept badly and a typical incident was when one night he came downstairs, took the cat's meat from the refrigerator and ate it.

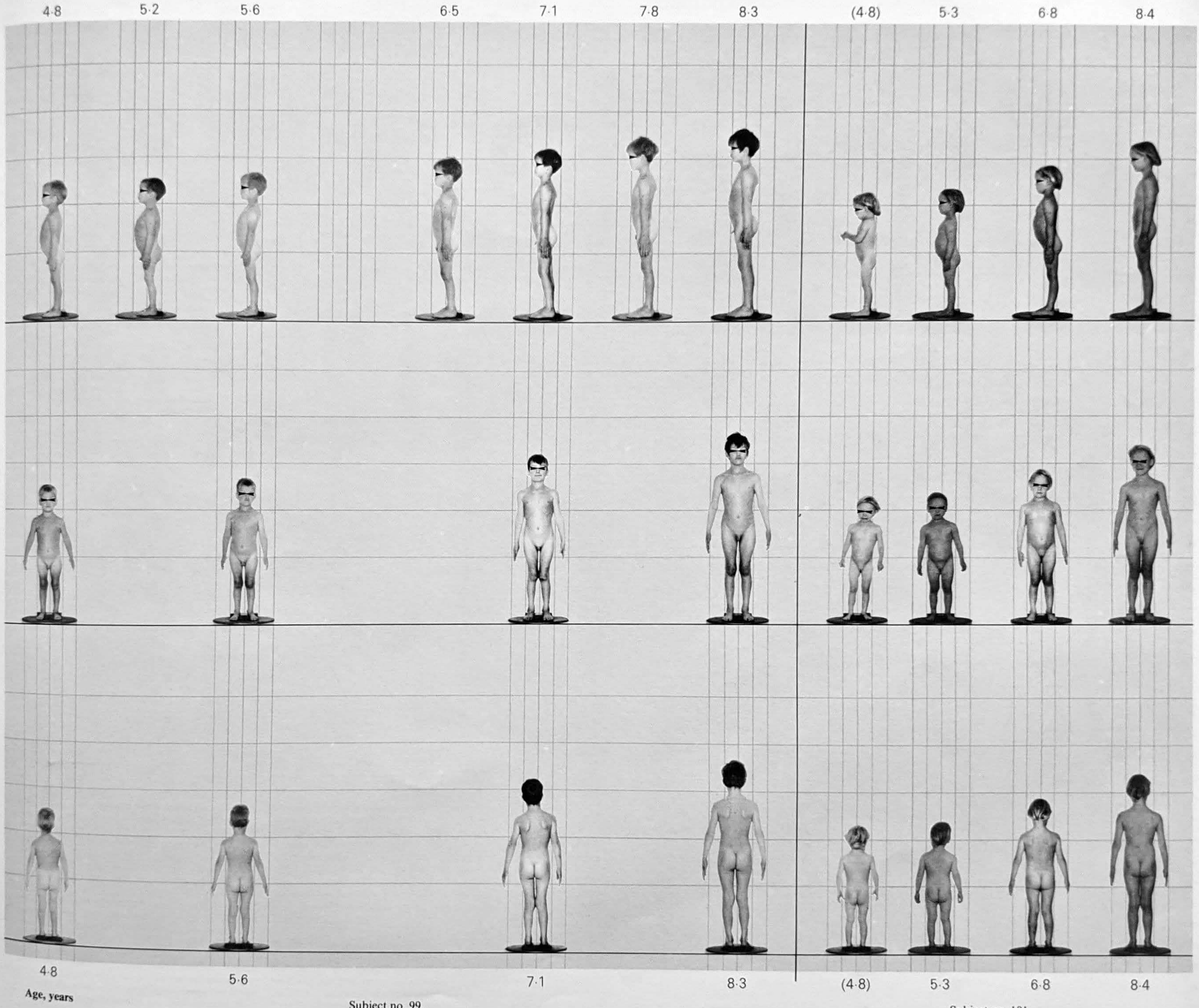
Mother readily agreed that the child was probably "delicate" (a designation we fiercely oppose when mothers apply it to small children with growth hormone deficiency, Silver–Russell Syndrome, or even panhypopituitarism on replacement therapy). In consequence, the boy was sent to a special boarding school for delicate children where his growth showed a marked and sustained catch-up. Height reached the 15th centile after 3 years of this "treatment". No drugs were given at any time. We have no measurements of growth hormone response in this child, but his weight was relatively less reduced than his height and his triceps skinfold was at the 75th centile before going to the "delicate" school, where, after an initial increase, it fell to the 50th. Thus he was not suffering from starvation. Thyroid function was normal, so we presume he had reversible growth hormone deficiency with a disturbance of the nearby appetite centre, both for psychosocial reasons. The catch-up was similar in both sitting height and leg length, and also in biacromial and biiliac diameters. Skeletal maturity was initially very retarded but caught up to the 50th centile after 3 years. His pictures show the marked catch-up and loss of a rather potbellied shape.

Subject no. 100, another boy, was in similar circumstances. His measurements only are given here on the same charts as subject no. 99. He also had a very disturbed home background and was sent to a boarding school immediately after the first measurement. His weight was also less reduced than his height. His triceps skinfold was at the 15th centile, whereas starvation adequate to cause smallness of the order seen in this subject is associated with skinfolds much below the 3rd. Catch-up was marked and sustained in all measurements. Bone maturity score was initially at the 5th centile and advanced to the 25th.

Subject no. 101, a girl, was the second child in a sibship of two with a birth weight of 2950 g (−0·8 SD). The home was disorganized, and attendance at doctors' clinics or hospitals very unreliable. When first seen, she was very small and thought to have isolated growth hormone deficiency, but as soon as she started school at age 5·4 a remarkable catch-up in growth occurred, taking her to the 3rd centile for height after 4 years. Her mother remarked that she seemed to like school much better than home. Her weight was never low in relation to height, and triceps skinfold was at the 10th (subscapular skinfold however at the 30th) and rose during the early consultations. This was far from a picture of starvation. In this subject an insulin hypoglycaemia test of growth hormone release was done at age 5·9 during a hospital admission and a peak value of only 6 mU/litre was found, an abnormal value (in starvation growth hormone is high, not low). The test was repeated at age 8·9 when the result was quite normal, with a peak of 39 mU/litre. By this time height was at the 3rd centile, weight at the 10th, triceps skinfold down again to the 15th, biacromial diameter at the 25th, biiliac diameter at the 20th and bone maturity score at the 10th. Sitting height and leg length were in approximately average proportion.

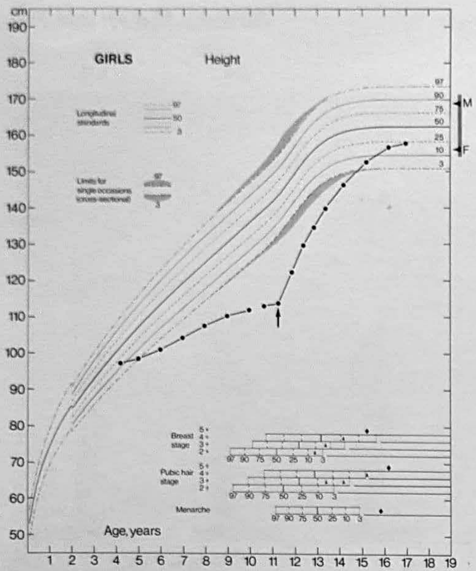
The pictures show an initially obviously unhappy girl, growing into the smiling subject of the last occasion.

Short Stature due to Psychosocial Stress with Catch-up on Change of Environment — *Subjects Nos 99 and 101*



Subject no. 99.

Subject no. 101.



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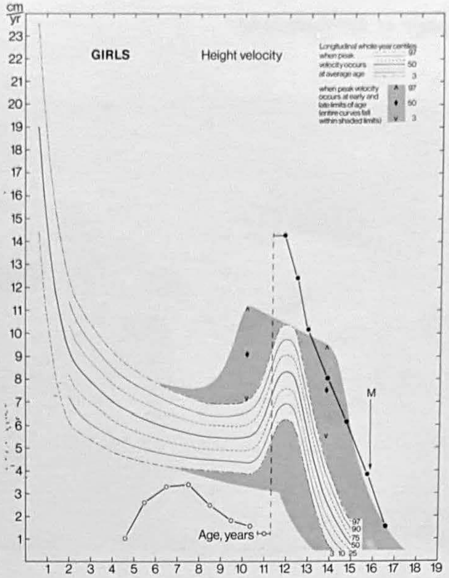


Fig. 2.

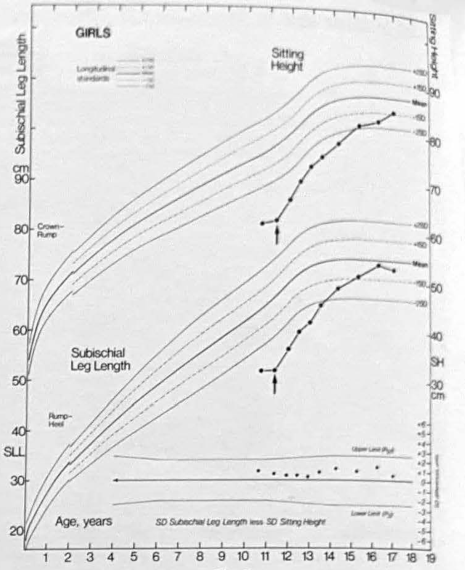


Fig. 3.

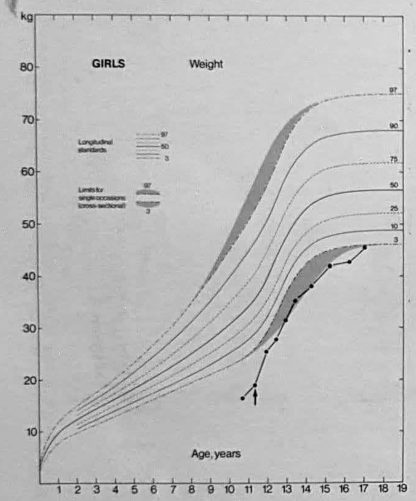


Fig. 4.

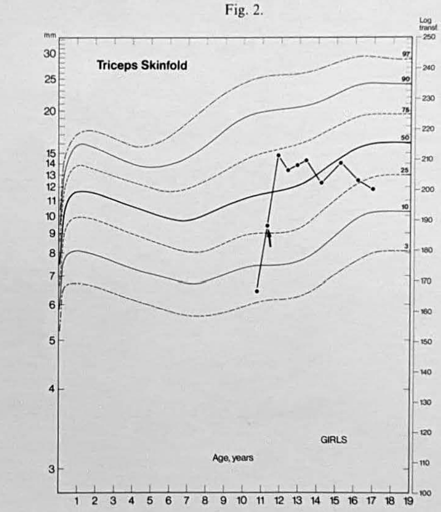


Fig. 5.

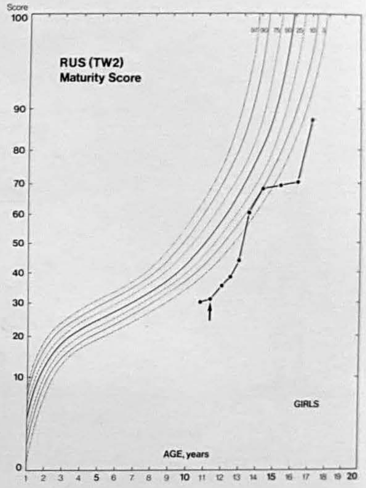


Fig. 6.

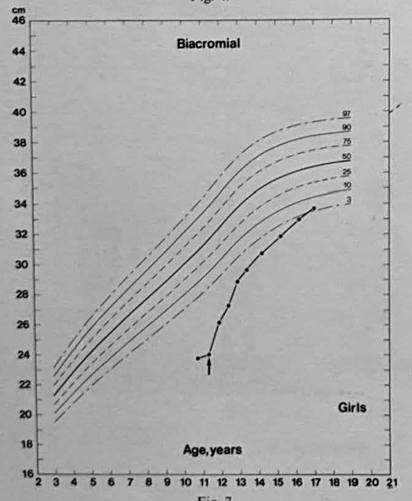


Fig. 7.

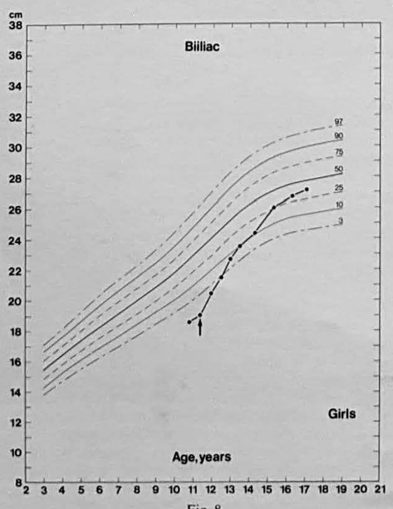


Fig. 8.

Coeliac Disease

Subject No. 102

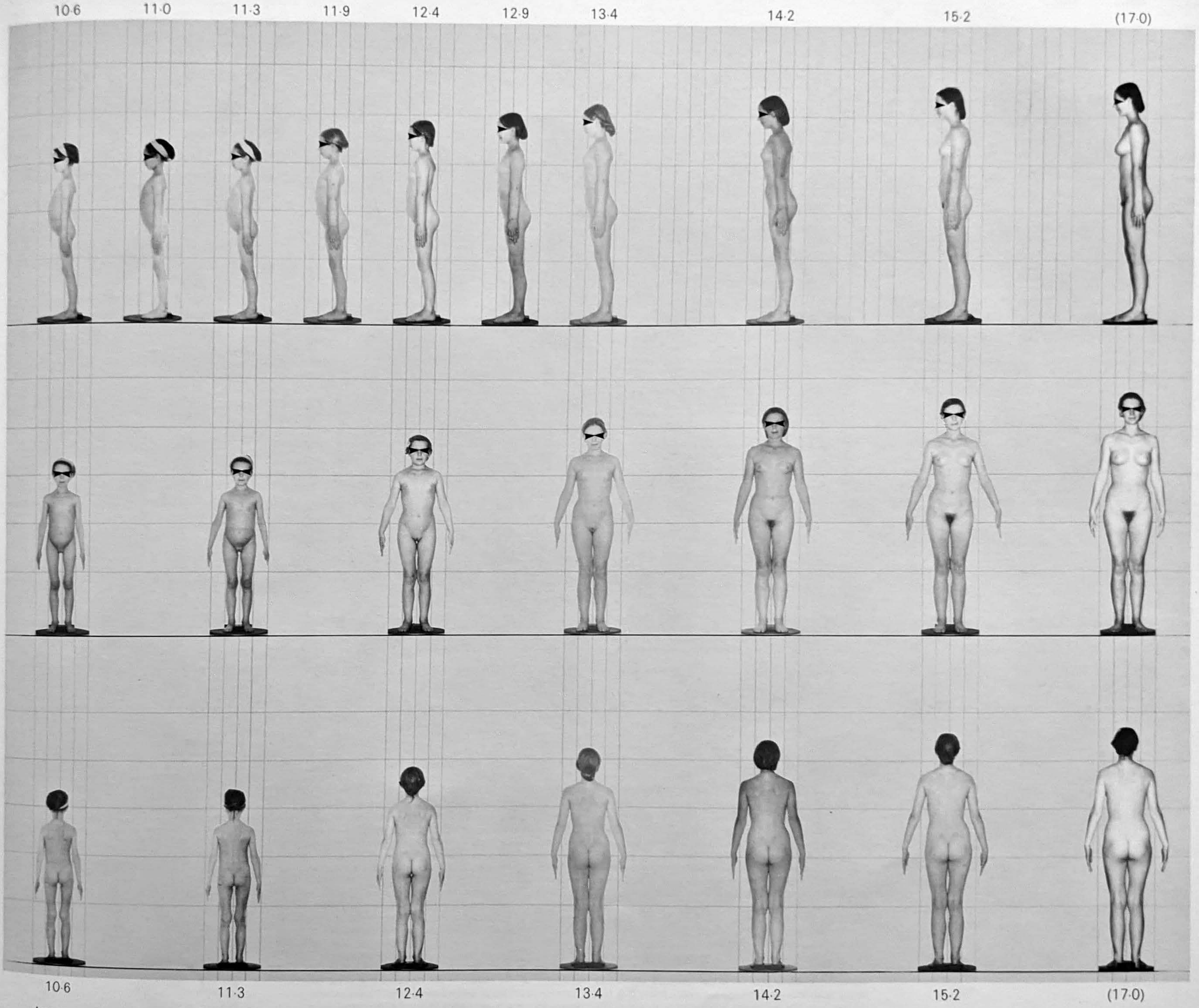
A girl with undiagnosed coeliac syndrome, who responded to a gluten-free diet with a classical catch-up. She had none of the usual symptoms of coeliac syndrome, and even when the diagnosis had been established by jejunal biopsy she denied any history of gastrointestinal upsets, flatulence or bulky stools. This was despite being an intelligent and apparently reliable informant, as were the other members of her family. She came with the complaint simply of short stature, and the abnormal degree of abdominal protrusion was noticed on the side view pictures (where it is usually much more visible than on clinical examination).

The height chart (Fig. 1) shows measurements made by parents and the family doctor till age 10, and by the Growth Clinic from age 10·6. Her height velocity (Fig. 2), very low indeed at 4·5 years, picked up somewhat from age 6 to 8 for reasons that are unclear. When the gluten-free diet was instituted height catch-up was immediate and impressive and this subject's final height was well within the parental target area. Because of her delay in growth, however, puberty was late and the adolescent spurt was confounded with the catch-up and is not visible. Menarche was at 15·9 years, which would usually imply that the peak height velocity would have to be looked for at about 14·5.

Sitting height and leg length (Fig. 3) are about equally reduced and have their catch-ups in proportion. Biacromial diameter (Fig. 7) catches up to the 3rd centile and biiliac (Fig. 8), never as small, to the 30th. Weight rises rapidly, but ends at the 3rd centile only. Triceps skinfold (Fig. 5) before diagnosis is at the 5th to 25th centile, rises to the 75th and then gradually falls to the 20th. Bone maturity score (Fig. 6) is well below the 3rd centile at diagnosis, increases relatively slowly on treatment, reaches the 10th centile after 2 years and then pauses again (fortunately, since it gave a longer time for height growth to continue to a normal final value). Part of this subject's delay in growth may be of normal familial origin; her mother's menarche was at 13·9 years and the father had a late height spurt.

The pictures show the marked abdominal protrusion. The first three side views are before the diet began and already by the fourth picture the abdomen is returning to normal shape, which it achieves soon after.

Subject No. 102



Age, years

Diet was started at age 11·3.

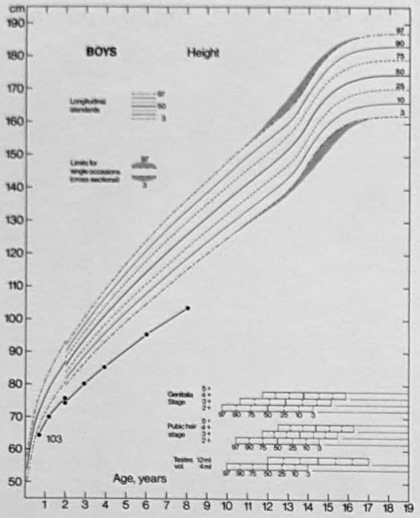


Fig. 1.

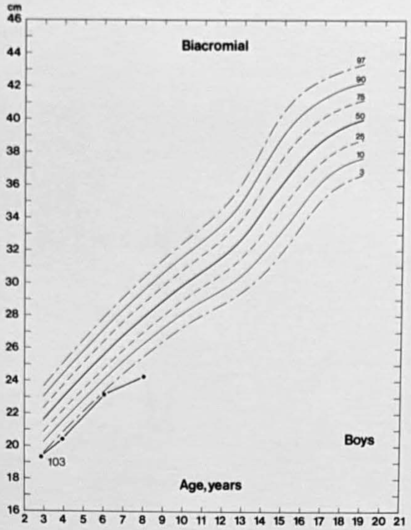


Fig. 2.

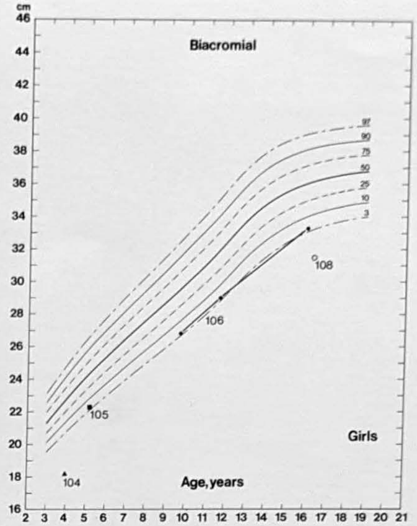


Fig. 3.

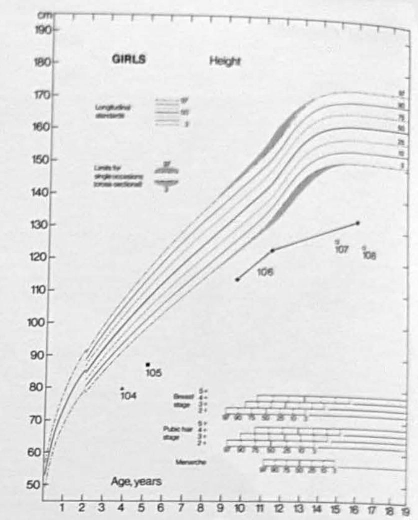


Fig. 4.

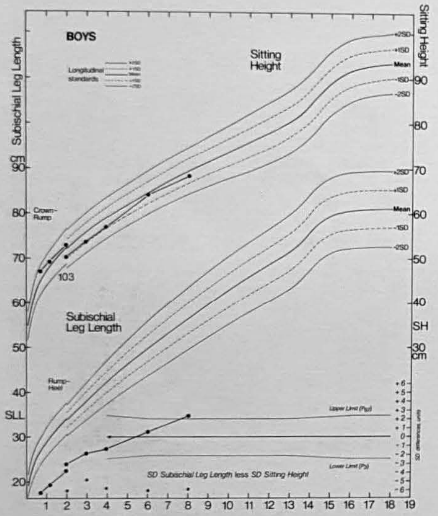


Fig 5

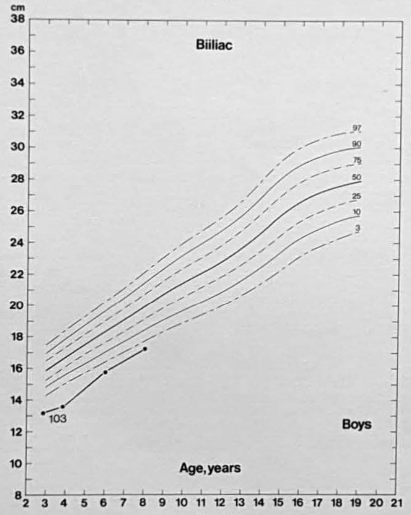


Fig. 6.

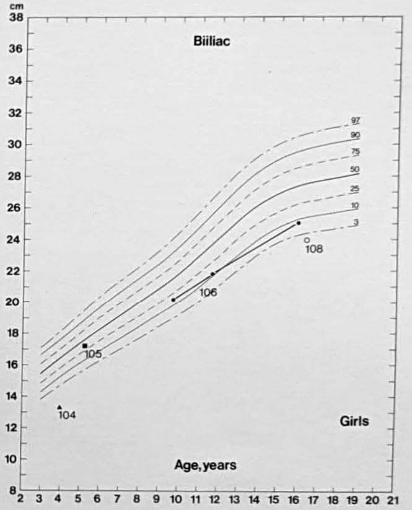


Fig. 7.

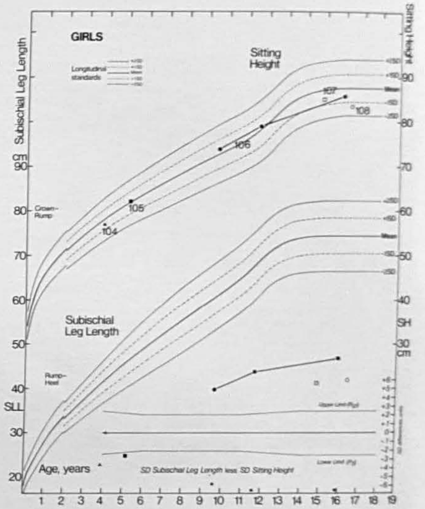


Fig. 8.

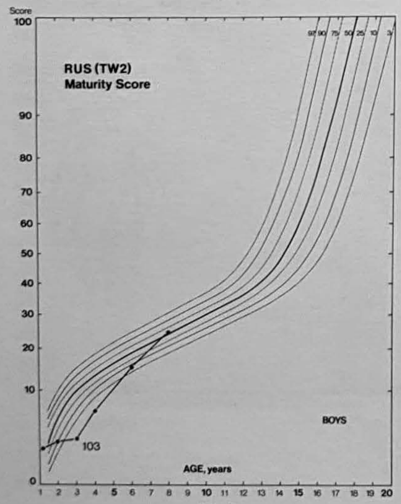


Fig. 9

Achondroplasia

Subjects Nos 103, 104, 105, 106, 107 and 108

These six subjects all have achondroplasia. No. 103, a boy, is shown in pictures from age 2 to 8 to give an idea of the growth pattern. The achondroplasiac features are already present very early; indeed diagnosis of a typical patient is possible at birth, but the degree of the disorder varies a good deal.

His charts show height (Fig. 1), sitting height and leg length (Fig. 5), biacromial (Fig. 2) and biiliac (Fig. 6) diameters and bone maturity score (Fig. 9). Supine length is already below the 3rd centile at 0·8 years; length or height velocity (not shown) is around the 5th centile throughout. Sitting height (Fig. 5), however, is at the 25th to 40th centile; virtually the whole height deficit is due to reduction of leg length. Leg length for sitting height (lowest section of the chart) is, of course, grossly abnormal with the difference of SD scores falling below the lower limits. Biacromial diameter (Fig. 2) is low compared with sitting height, being at or just below the 3rd centile. Biiliac (Fig. 6) is likewise below the 3rd, though it increases as the subject gets older. Skeletal maturity (Fig. 9) is average at 1·2 years, falls somewhat, then catches up to the 50th centile again at age 8. The pathological appearances in the bones of the hand and wrist interfere only slightly with the bone maturity ratings.

Subjects nos 104–108 are girls, and each of their measurements are plotted together. Subject no. 106 has been seen several times and two pictures are shown, at 9·6 and 16·0 years. All subjects are greatly reduced in height and weight. The mean adult height of women with achondroplasia is said to be 124 cm, so these subjects are mostly above average (Fig. 4) (mean height in male achondroplasia is said to be 131 cm; Smith, 1976). The sitting heights are all within normal limits (Fig. 8); two are at the 50th, two at the 25th and one at the 10th centile. Leg length is so reduced for sitting height that the plots of the differences of the SD scores are actually off the chart in four of the six cases. In Fig. 8 the small circles relate to no. 106; note that the lower plots of nos 104 and 105 are for leg length not SD differences.

Biacromial diameter (Fig. 3) is available on four girls only. It is reduced, in two subjects to the 3rd centile and in the two others much below that. Biiliac diameter (Fig. 7) is also reduced, though not so much, one subject being at the 30th centile, one at the 10th and the others below the 3rd. In achondroplasia growth of the limb girdles is affected, just as is growth of, in particular, the proximal segments of the limbs. Skeletal maturities are all normal (Fig. 10).

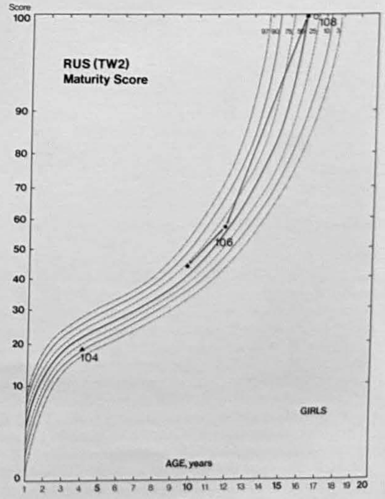
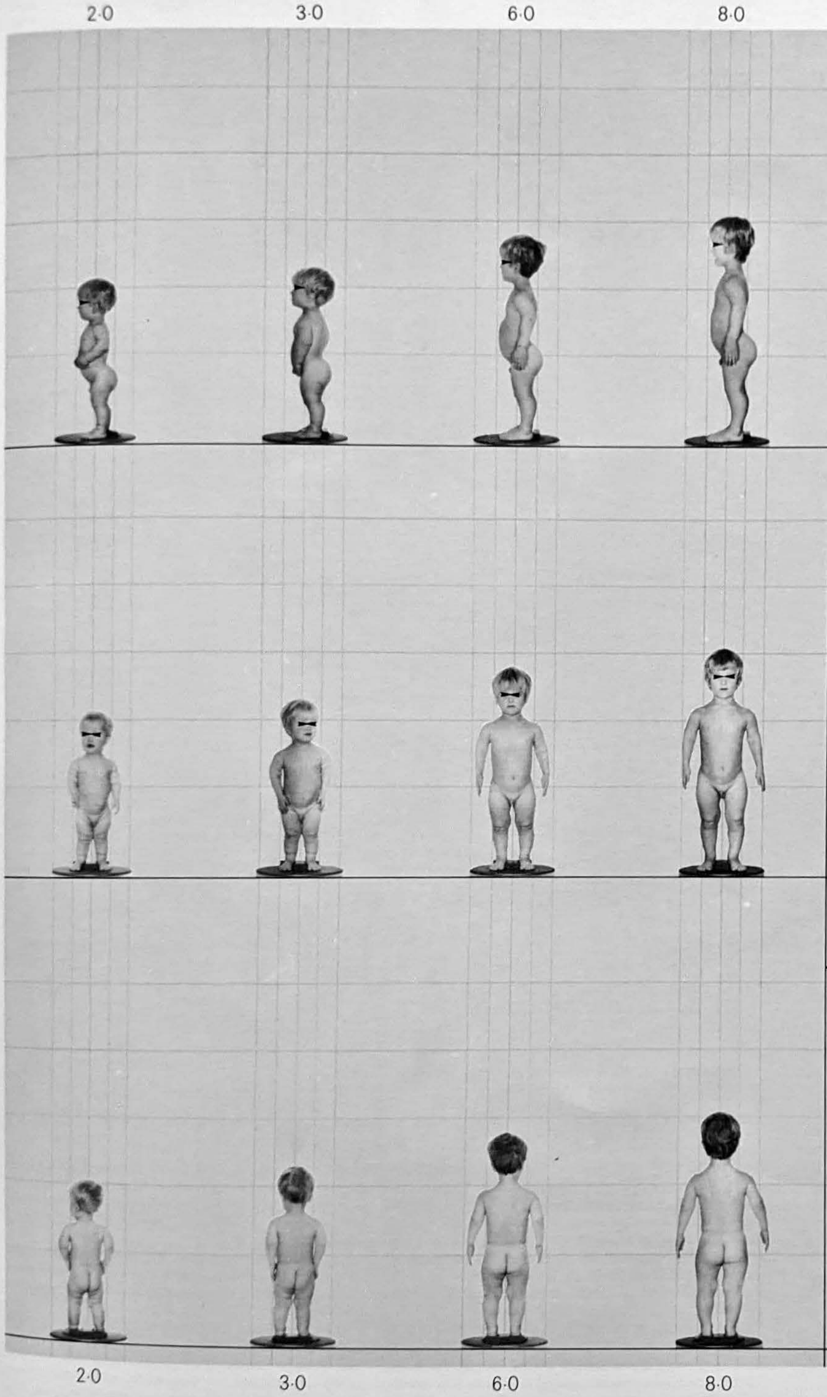
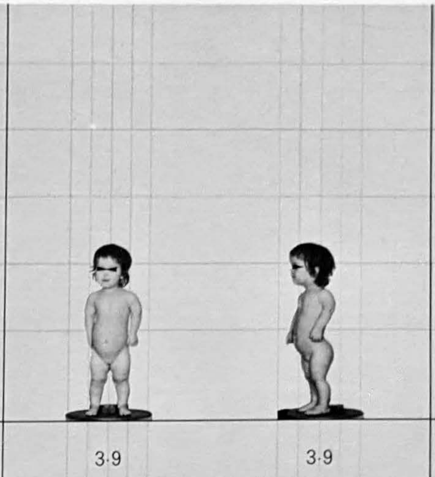


Fig. 10.



Age, years

Subject no. 103.



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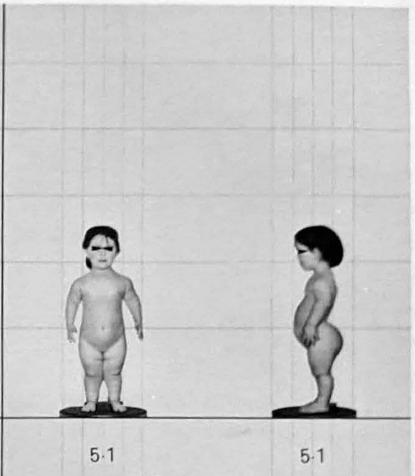
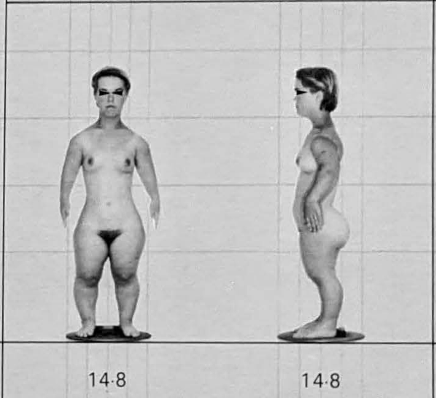
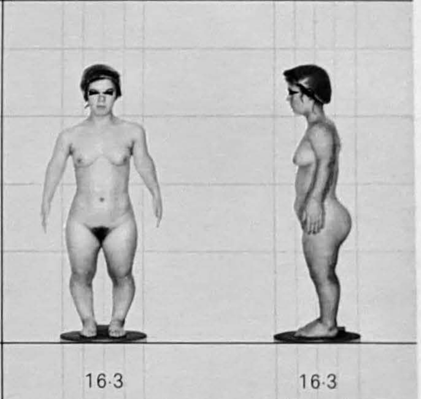


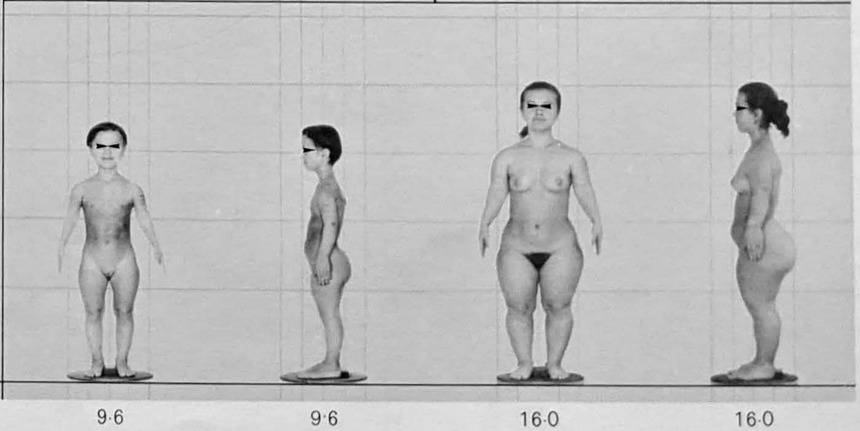
Subject no. 105.



Subject no. 107.



Subject no. 108.



Subject no. 106.

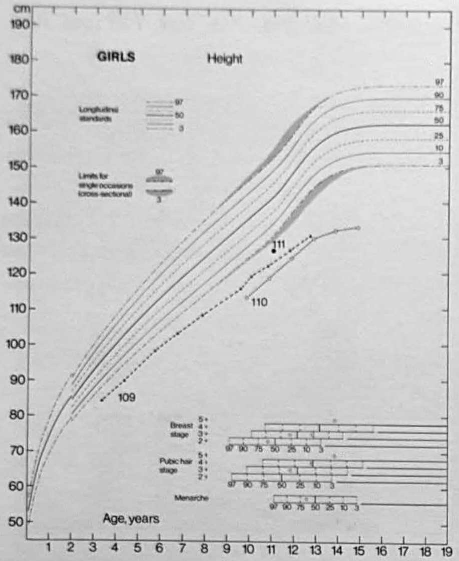


Fig. 1.

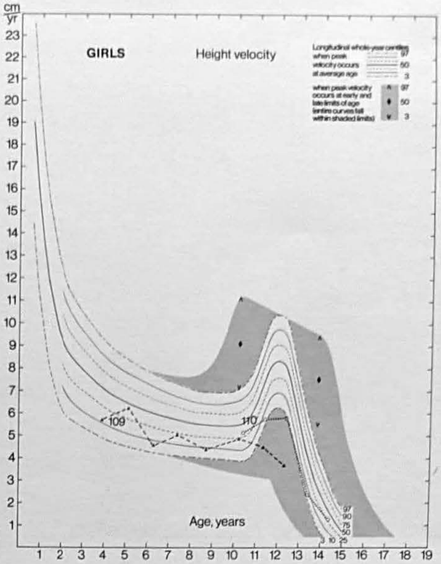


Fig. 2.

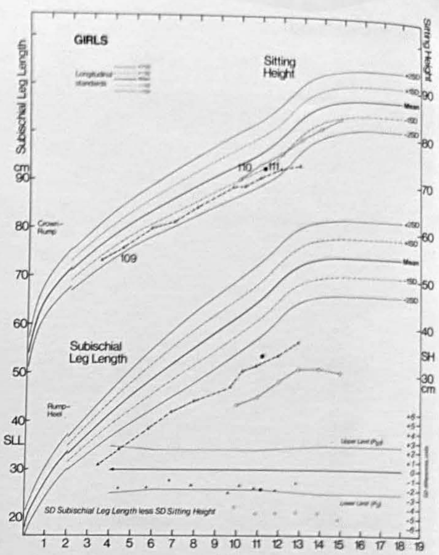


Fig. 3.

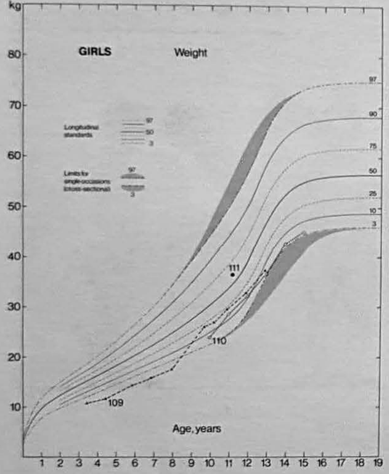


Fig. 4.

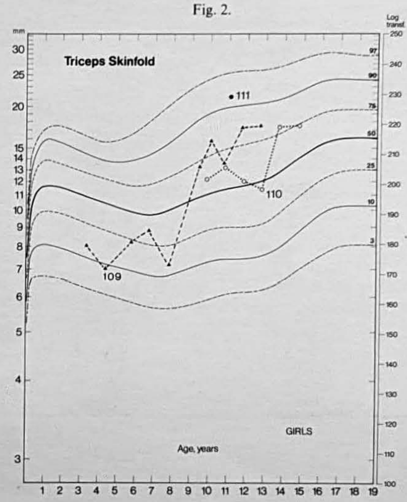


Fig. 5.

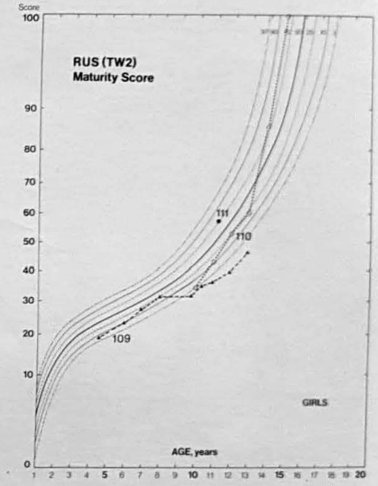


Fig. 6.

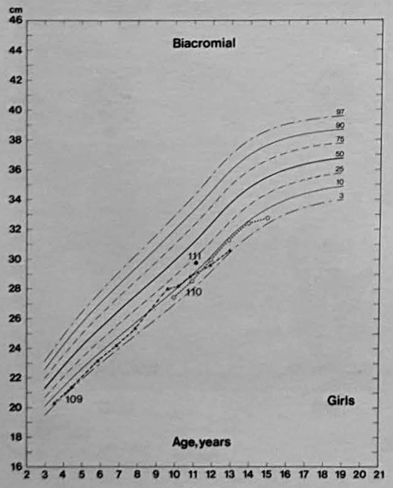


Fig. 7.

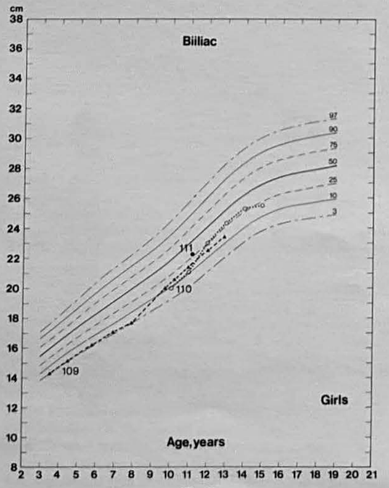


Fig. 8.

Hypochondroplasia

Subjects Nos 109, 110 and 111

Three girls with hypochondroplasia. Subjects with this disorder appear quite frequently in the Growth Disorder Clinic, as the condition is much less obvious than achondroplasia. It is also inherited as a single-locus dominant, but whereas in achondroplasia most cases are new mutations, a family history is very frequent in hypochondroplasia. The two conditions seldom, if ever, occur in the same family and are believed to be due either to genes at different loci or to different genes in a multiple allelic series (McKusick, 1972; Carter and Fairbank, 1974).

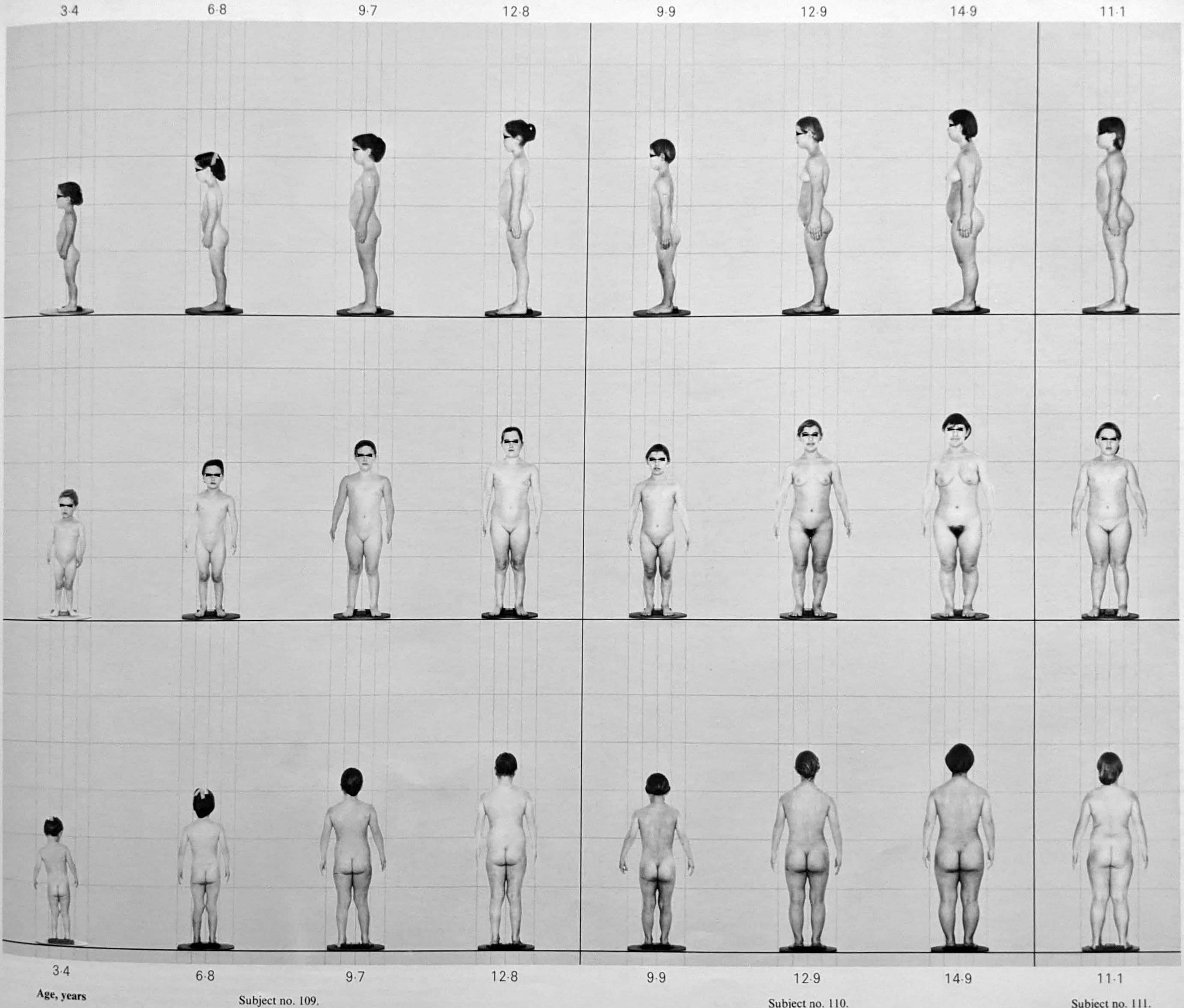
The height (Fig. 1) and height velocity (Fig. 2) curves are much nearer normal than in achondroplasia. Final height in these three subjects will average around 140 cm. The height velocity chart shows velocities around the 10th to 25th centiles, with rather small peaks at just the average time in no. 110, and later, evidently, in no. 109.

The sitting height–leg length chart (Fig. 3) has particular interest. All three subjects have sitting heights within normal limits (except for no. 109 at 12·9, due to a rather delayed puberty). The difference between the SD scores of sitting height and leg length is at the normal lower limit for nos 109 and 111, and beyond it for no. 110, whose proportions are about half way to those seen in achondroplasia, although her face is not at all achondroplastic.

Biacromial (Fig. 7) and biiliac (Fig. 8) diameters are at about the same centiles as sitting height in all subjects. Bone maturity scores (Fig. 6) are within normal limits, except for subject no. 109 after age 10 when delay occurs.

The pictures show the three subjects at selected ages. The faces of subjects with hypochondroplasia, though quite different from those of achondroplasiacs, have usually something sufficiently characteristic for them to be recognizable at once. However, the diagnosis in some cases remains uncertain, both by radiological and auxological criteria. Lightly affected persons probably pass as normals.

Nos 109 and 111 have negative family histories. No. 110 has a brother with the disorder but no earlier family history.



Subject no. 109.

Subject no. 110.

Subject no. 111.

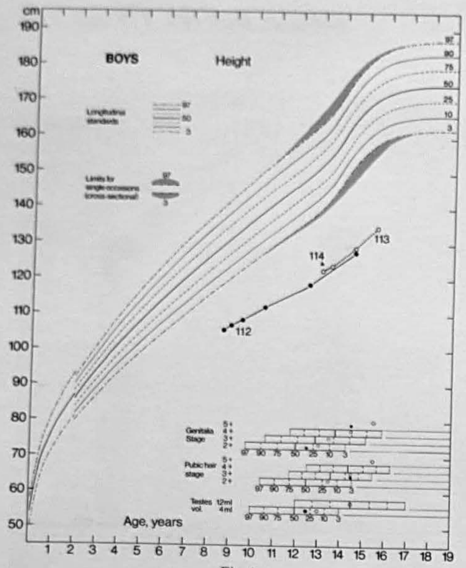


Fig. 1.

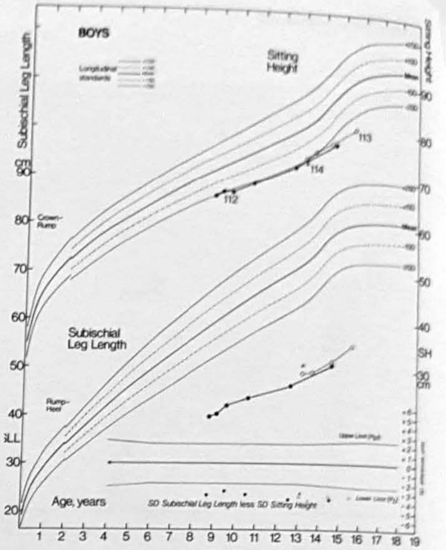


Fig. 2.

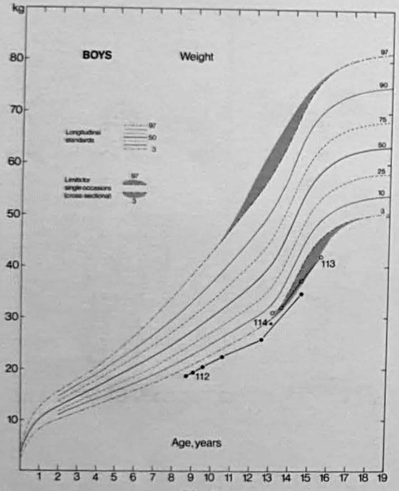


Fig. 3.

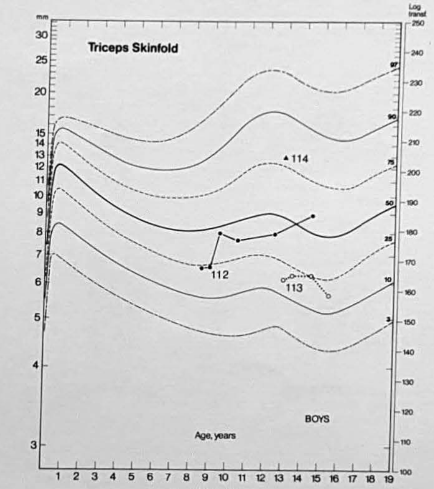


Fig. 4.

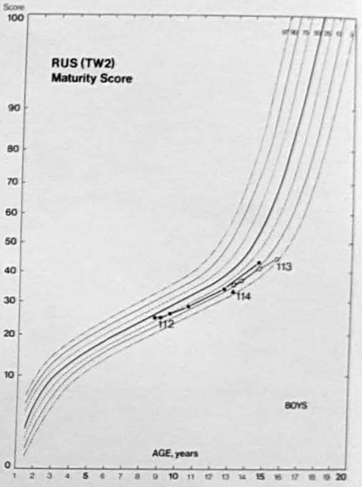


Fig. 5.

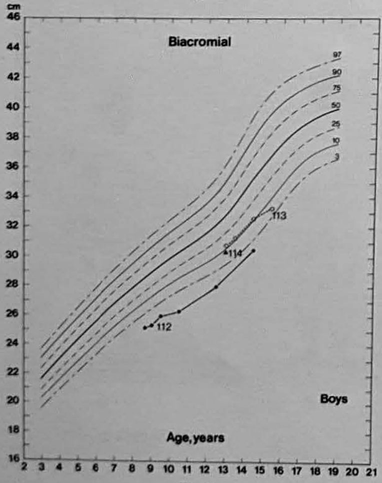


Fig. 6.

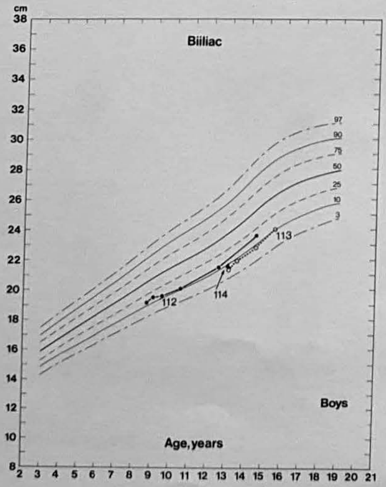


Fig. 7.

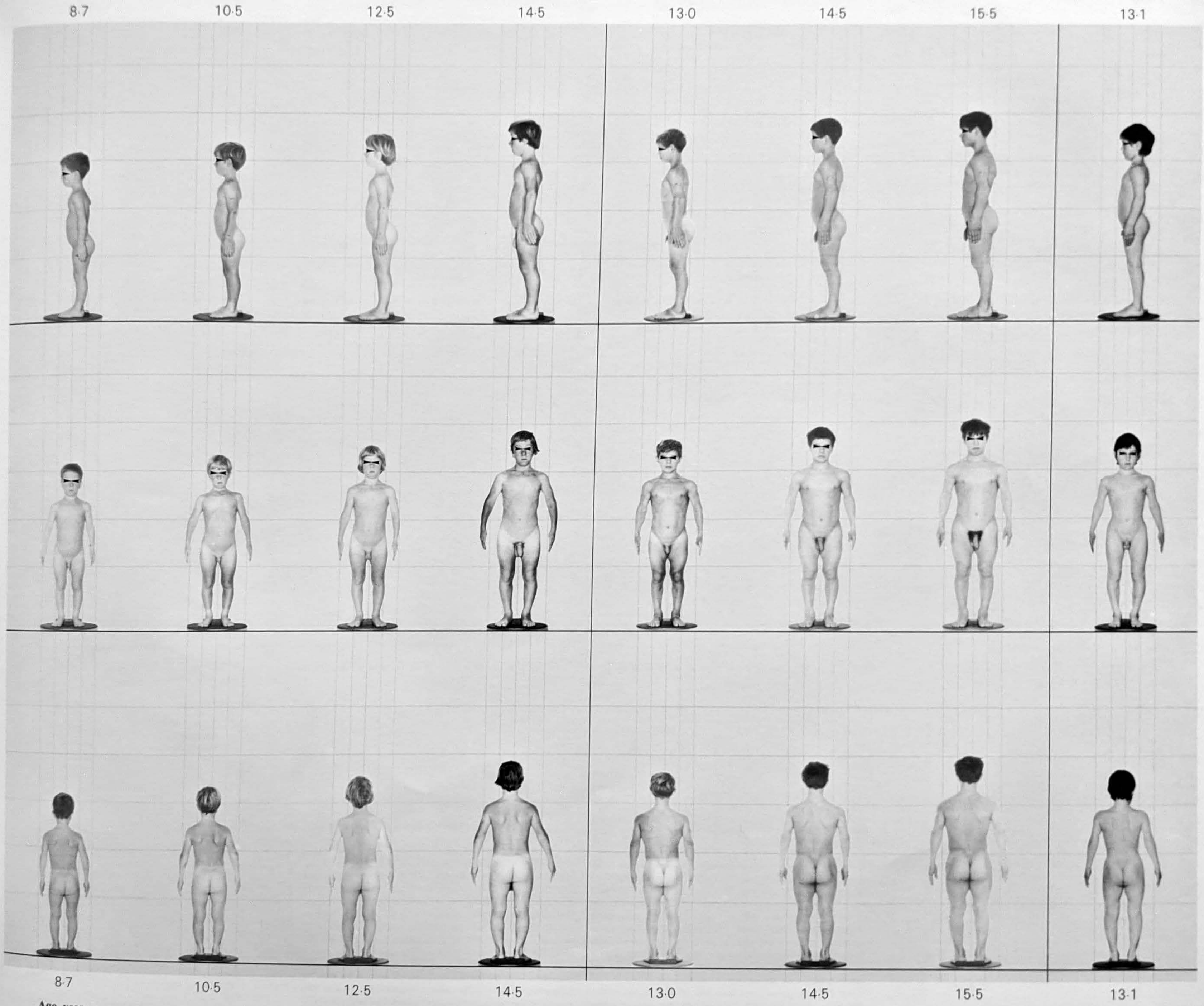
Hypochondroplasia *Subjects Nos 112, 113 and 114*

Three boys with hypochondroplasia. The height curves (Fig. 1) and predictions indicate final heights averaging around 150 cm or a little less.

The mother of no. 112 has the disorder but she is the only one in her family to do so. The sister of no. 113 is no. 110 on the preceding page. No. 114 has a negative family history.

All three subjects have sitting heights (Fig. 2) at just about the 3rd centile, with leg lengths much below it. The differences in SD scores are below the lower limit, and about half way to the difference seen in achondroplasia. The biacromial diameters (Fig. 6) range from below the 3rd to the 10th centile; the biiliac diameters (Fig. 7) are all around the 10th. Thus, these boys with hypochondroplasia seem to have rather lower sitting heights than the hypochondroplasiac girls, and definitely lower sitting heights than the achondroplasiacs. It may be that the hypochondroplasiac pathology spreads more widely but less violently throughout the skeleton than the achondroplasiac.

The pictures show the short, chunky physique. Like achondroplasiacs, these subjects make good athletes, particularly gymnasts.



Age, years

Subject no. 112.

Subject no. 113.

Subject no. 114.

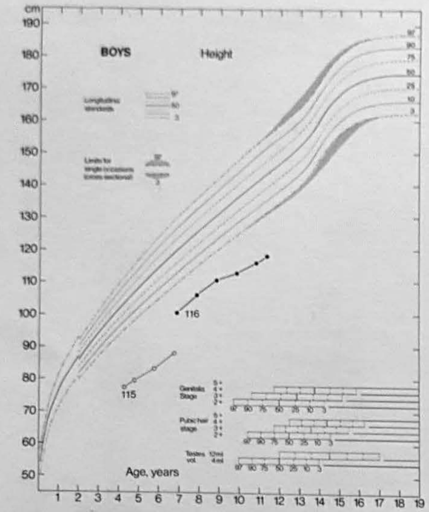


Fig. 1.

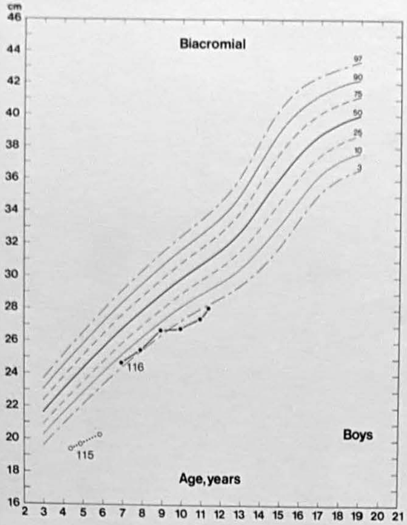
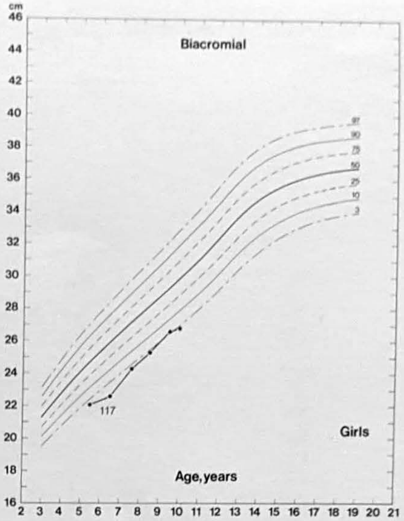


Fig. 2



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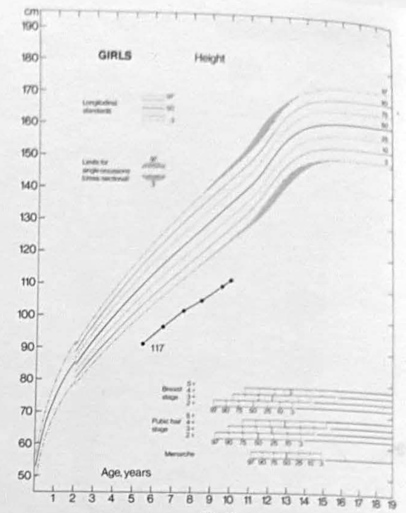

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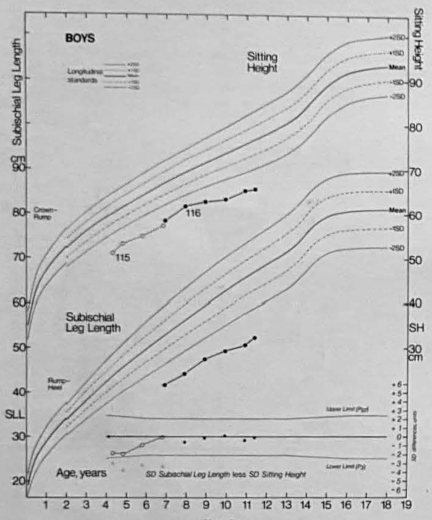
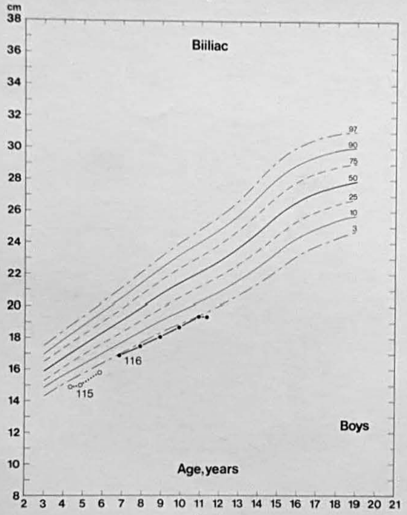


Fig. 5



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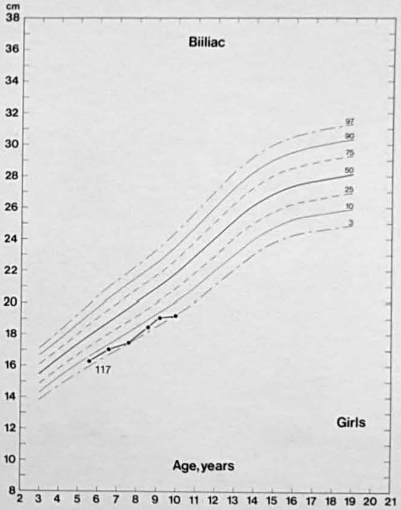
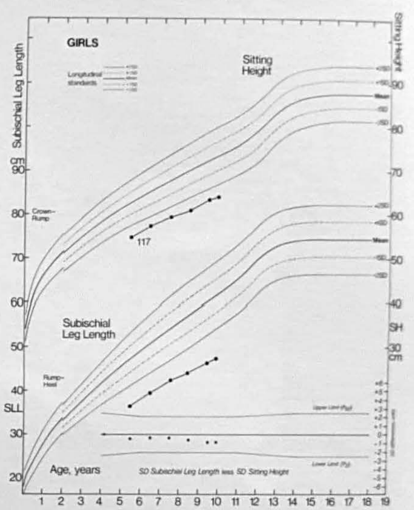


Fig. 7.



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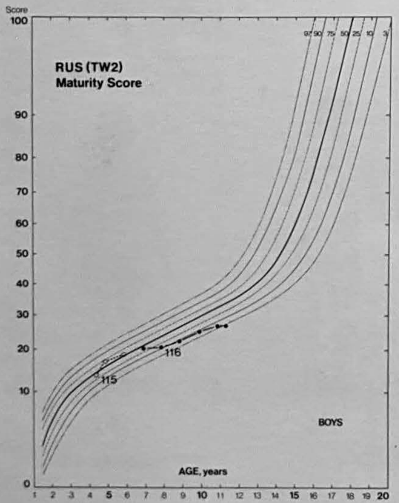


Fig. 9.

Metaphyseal Dysostosis Type McKusick (Cartilage-hair Hypoplasia)

Subjects Nos 115, 116 and 117

There are a number of metaphyseal dysostoses which cause short stature. All are rare and inherited. We present examples of only one, called *Cartilage-hair Hypoplasia* because subjects with it usually have fine, sparse head hair, which has a structure seen to be abnormal when viewed under the light microscope (McKusick *et al.*, 1965; Smith, 1976, p. 210). The inheritance is autosomal recessive and subjects nos 116 and 117 are siblings. Both parents are of normal stature and unrelated, and there is one other sister, who is normal. Subject no. 115 has a negative family history with one sib only, a normal sister.

No. 115 has typical head hair, less obvious in the brother and sister (nos 116 and 117) though the typical microscope appearances were present in both. The lower femoral metaphysis is particularly affected, causing bow legs, which in these subjects is mild and scarcely beyond the limits of normal.

Height is well below the 3rd centile with leg length much worse affected than sitting height in no. 115 (Fig. 5), and about equally affected in the siblings (Figs 5, 8). Biacromial diameter is at the 3rd centile in the sibs, but much below it in no. 115 (Figs 2, 3). Biiliac diameter is at the the 3rd in all three (Figs 6, 7). Skeletal maturity is about average in all three subjects initially (Figs 9, 10), but falls to the 3rd centile at 11 years in the older sib. In most aspects of the disorder the sibs are less seriously affected than subject no. 115.

The pictures show the characteristic build. The face also has something very characteristic about it, as can be seen by comparing all three faces under a magnifying glass and then looking at the extremely similar boy illustrated in Smith (1976, p. 210). When young, these patients often have symptoms of malabsorption which spontaneously disappear. No. 115 did not specifically complain of this, but he had a protuberant abdomen visible in the first picture, at age 4·8 years, as did the sibs.

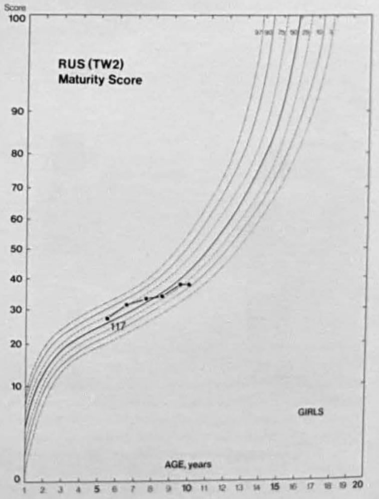
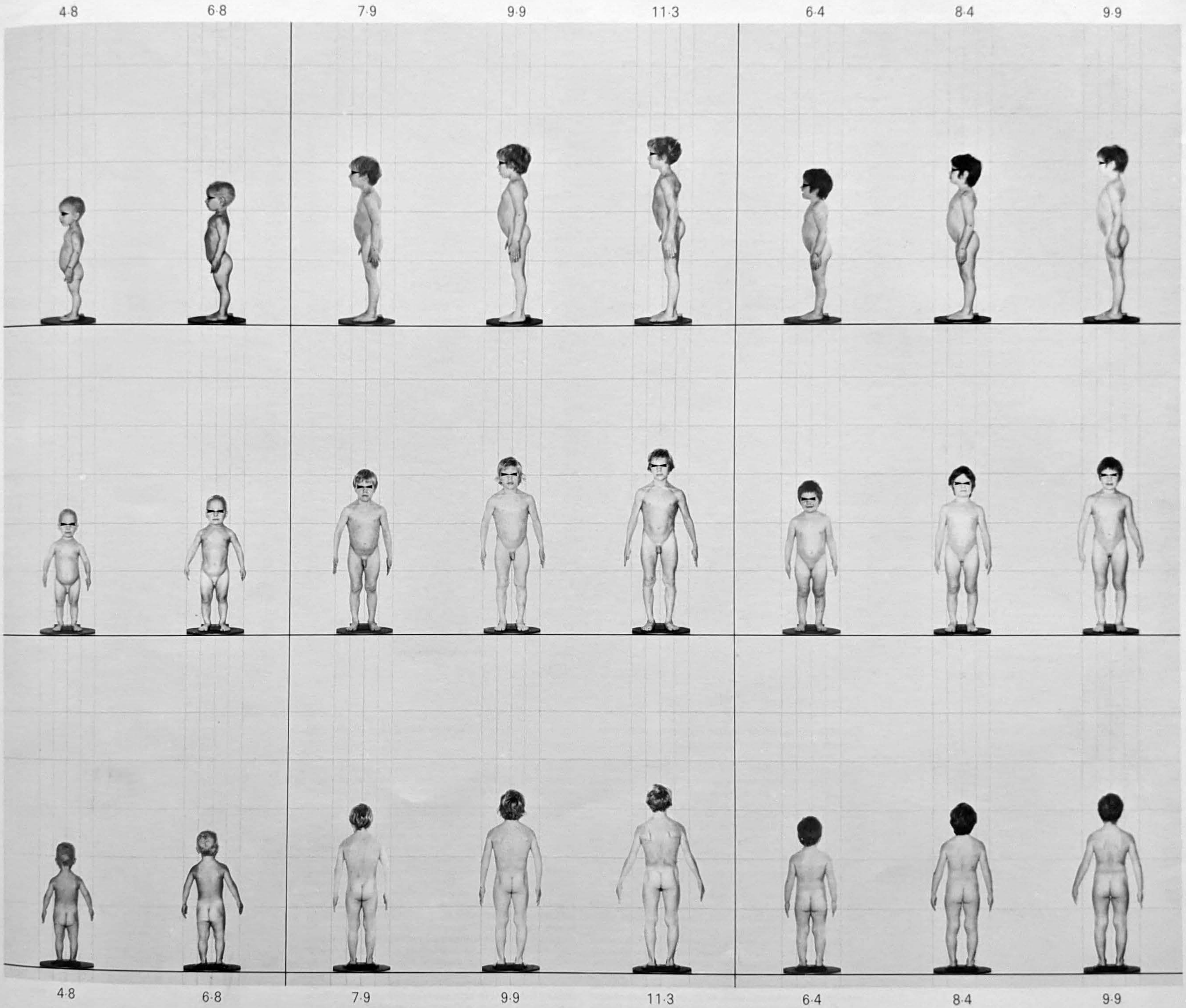


Fig. 10.



Age, years Subject no. 115. Subject no. 116. Subject no. 117.

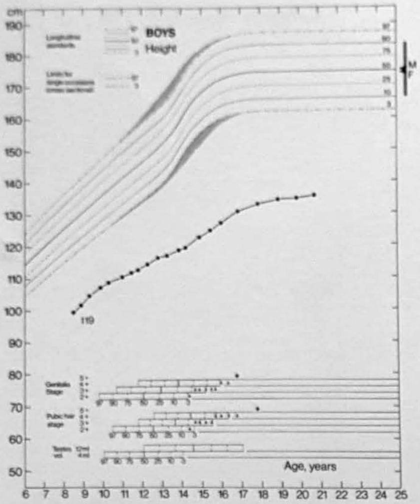
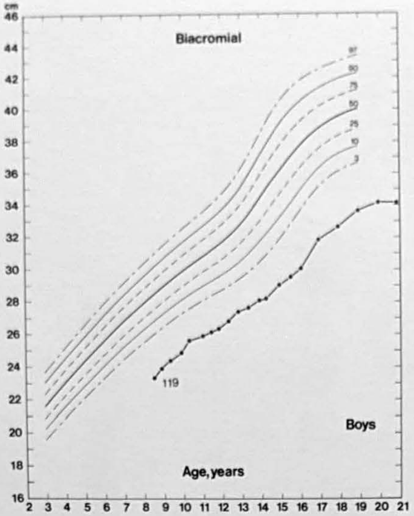


Fig. 1.



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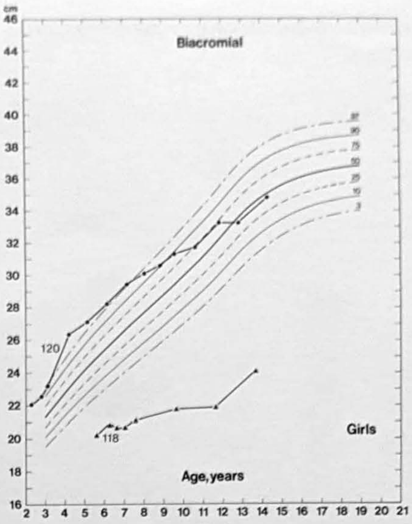

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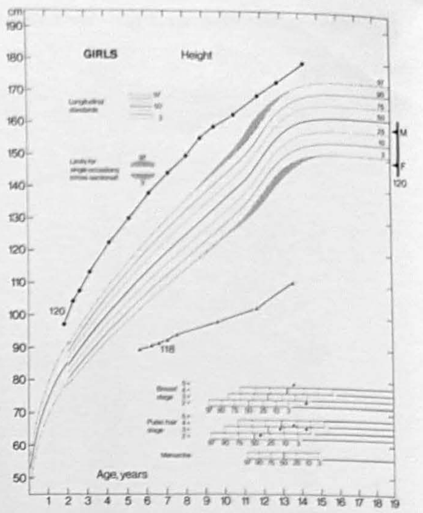

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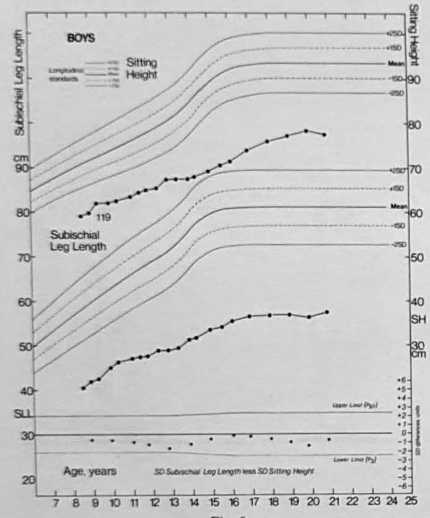

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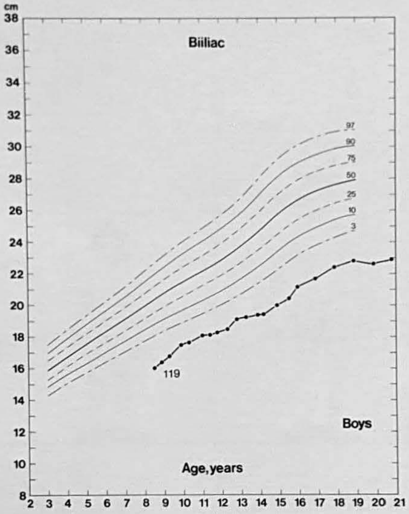

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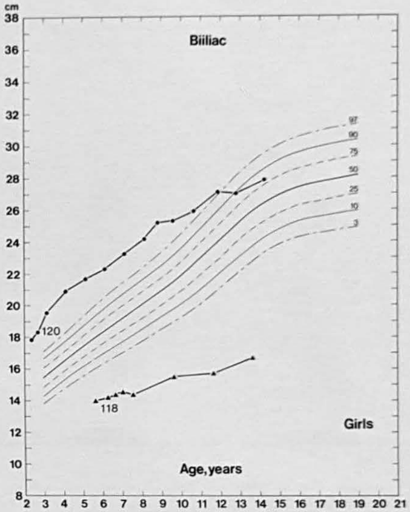

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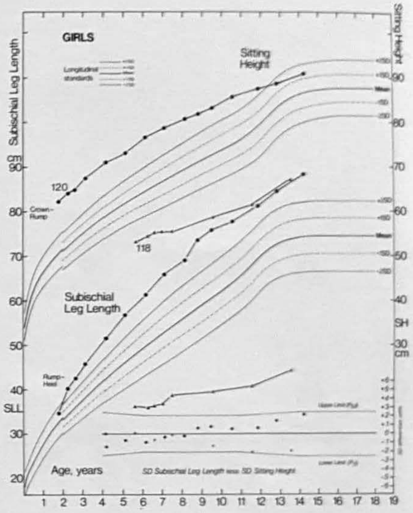

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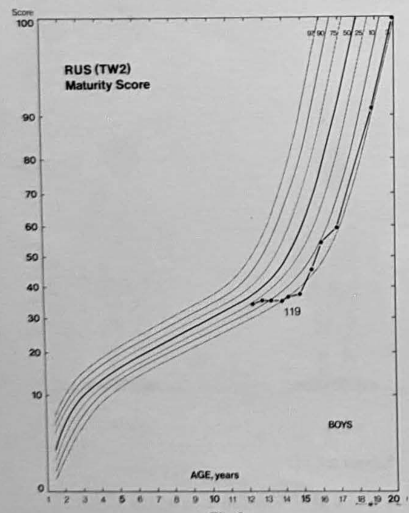


Fig. 9.

Dyschondrosteosis, X-linked Hypophosphataemic Rickets and Cerebral Gigantism

Subjects Nos 118, 119 and 120

This page shows subjects with different disorders. Subject no. 118 has dyschondrosteosis or Leri–Weil Syndrome (see Smith, 1976, p. 250). The diagnostic features are short forearms with bowing of the radii, and a pathological alignment of radius and ulna at wrist often associated with limitation of wrist movement and partial dislocation. The radiograph of the wrist is usually diagnostic. Short stature is usual (Fig. 4), but not invariable, and the disorder is inherited as an autosomal dominant, though with an excess of reported females. In no. 118 the disorder is evidently widely spread through the skeleton, for leg length is short relative to sitting height (Fig. 8), itself far below the 3rd centile. Biacromial and biiliac diameters are affected to the same degree as leg length. The face and build may be characteristic, for the girl illustrated in Smith (1976, p. 251) looks like our subject.

Subject no. 119 is a boy with X-linked hypophosphataemic rickets (Burnett *et al.*, 1964). Diminished renal tubular reabsorbtion of phosphate, and diminished phosphate uptake, give a low blood phosphate level and lead to a lowered rate of growth, rickets and progressive bowing of the legs. Height is much reduced (Fig. 1), with both sitting height and leg length affected (Fig. 5), but the latter more so, particularly as the bowing develops. Biacromial and biiliac diameters (Figs 2, 6) are below the 3rd centile and in approximate proportion to the sitting height. There is a definite though small adolescent growth spurt in height. Skeletal maturity (Fig. 9) is delayed from age 12 onwards, to about the 3rd centile, with the puberty stages equally late. This subject had a classical family history for an X-linked gene; his mother presumably carried the gene, but her height was at the 50th centile, while *her* father was very short and bow-legged.

Subject no. 120 has cerebral gigantism or Sotos' Syndrome (Sotos *et al.*, 1964; Smith, 1976, p. 88). Most of these patients resemble each other facially, with a long head, asymmetry of face, large ears and rather coarse features. The cause of the disorder is unknown. Somatomedin and growth hormone levels are normal, and there is seldom a familial incidence. Birthweight is high, being 4990 g (+4·1 SD) in no. 120. Crown-rump length and sitting height are enlarged more than leg length at first (Fig. 8), but later this is reversed and at ages 12·8 and 14·2 our subject has sitting heights within normal limits, while leg length is some way above the 97th centile. Height velocity is above the 97th centile at first, but falls to reach the 50th just before puberty. The predicted adult height is 181 cm (5′ 11½″) which is very far above the parental target (shown in Fig. 4), her parents being smaller than average. Biacromial and biiliac diameters (Figs 3, 7), at first very large, gradually fall into the normal range. Skeletal maturity (Fig. 10) is above the 97th centile initially, as is usual in this disorder, and remains advanced till shortly before puberty when it falls to the 25th centile.

Oestradiol was briefly administered from age 8·6 to 8·8 but caused a severe behaviour disturbance. This subject is of low intelligence and is unusually clumsy, both characteristics of the syndrome. The pictures show marked knock knees.

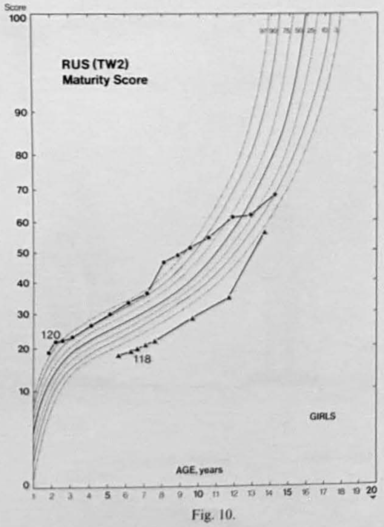
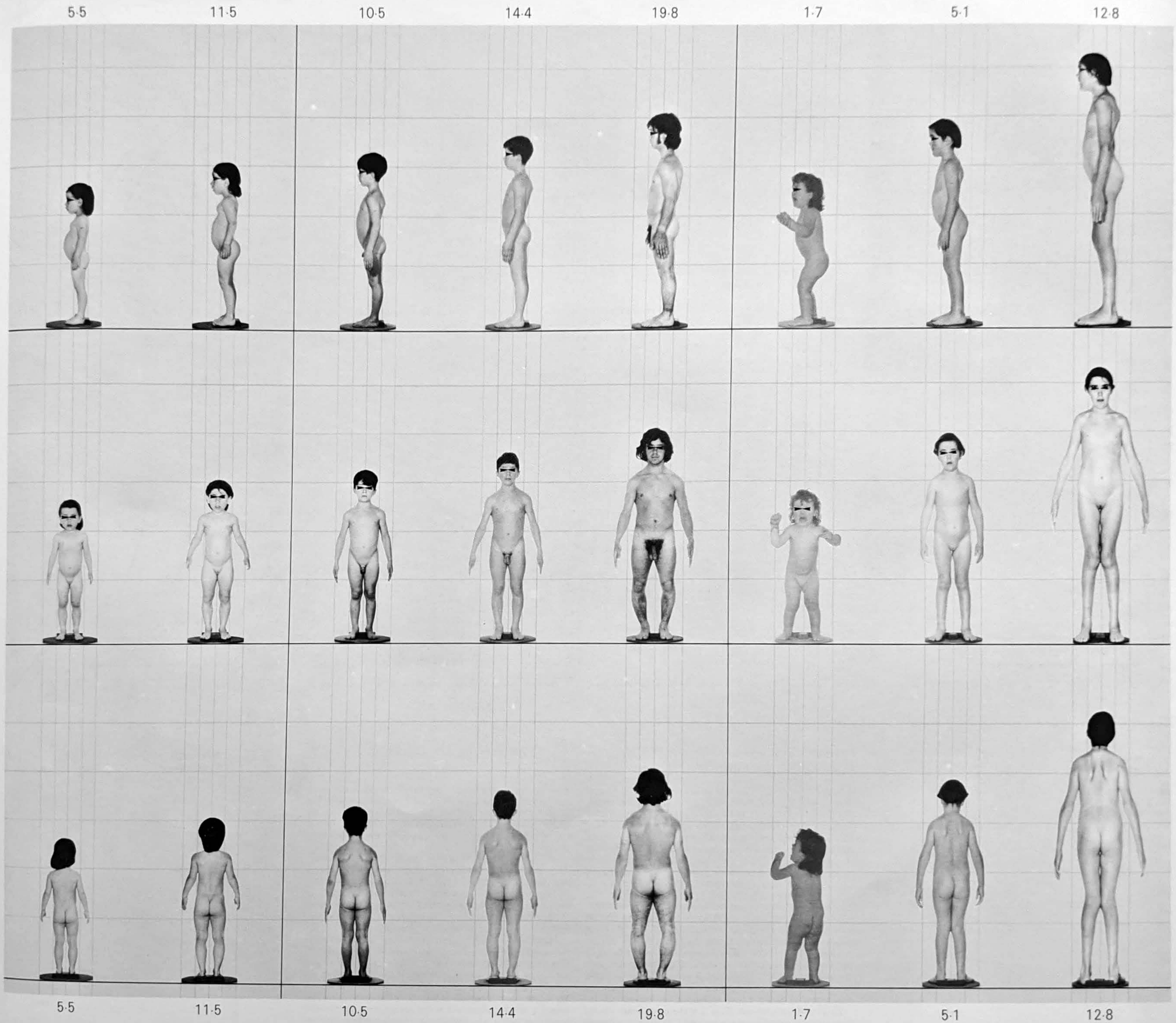
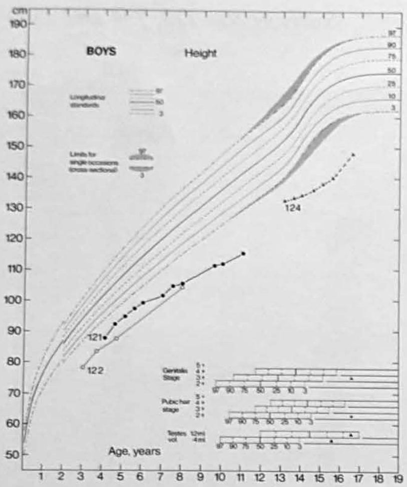


Fig. 10.



Age, years Subject no. 118. Subject no. 119. Subject no. 120.



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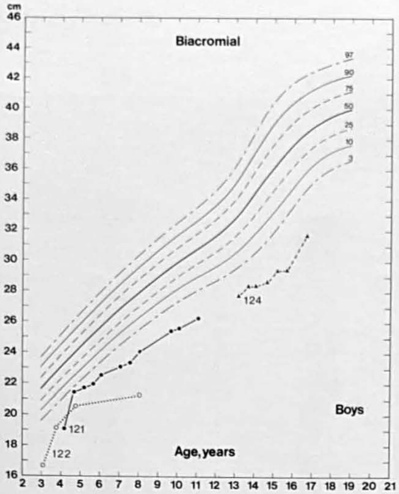

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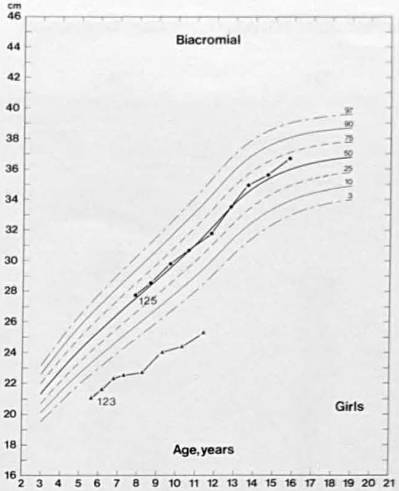

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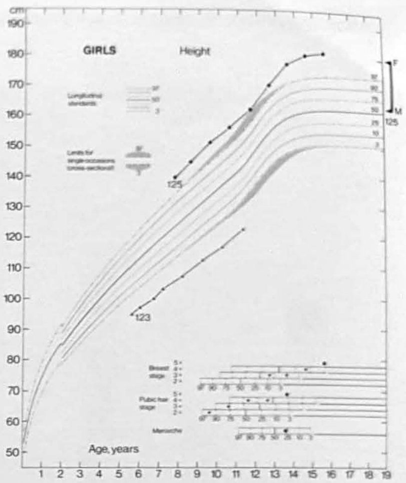

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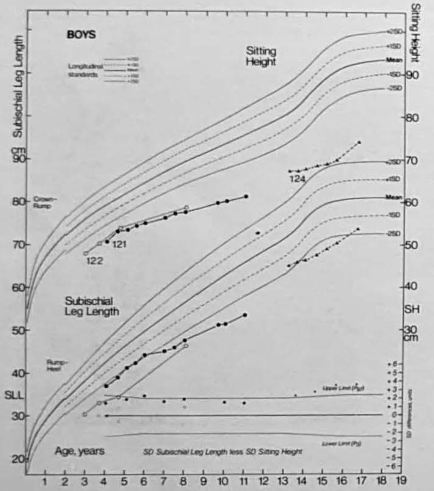

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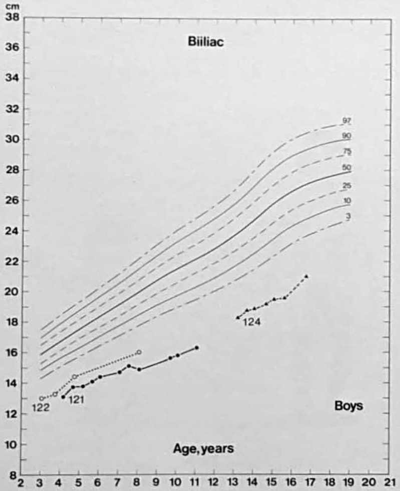

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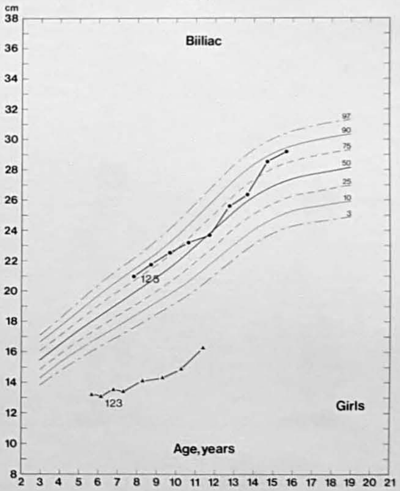


Fig. 7.

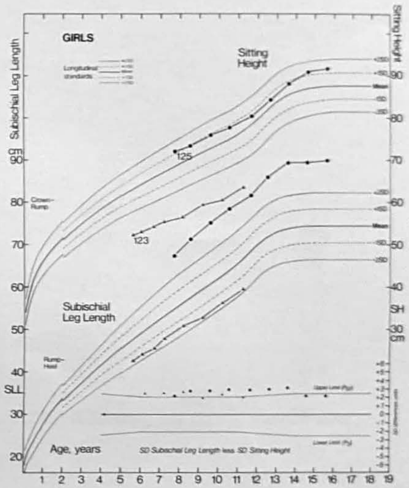


Fig. 8.

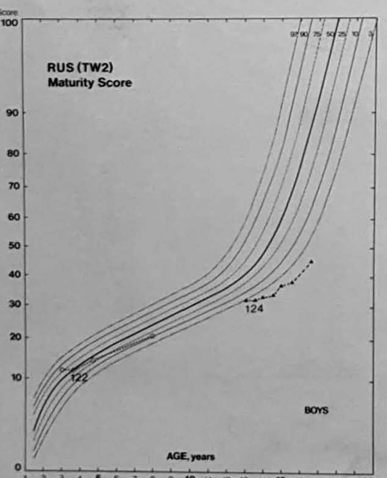


Fig. 9.

DeLange's Syndrome; Spondyloepiphyseal Dysplasia; Marfan's Syndrome

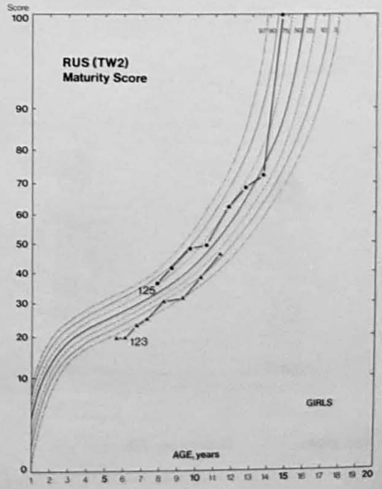
Subjects Nos 121, 122, 123, 124 and 125

Subjects 121 and 122 have DeLange's Syndrome (DeLange, 1933; Berg *et al.*, 1970; Smith, 1976, p. 56). Of unknown origin, this causes short stature and severe mental deficiency. Facial appearance is characteristic, with upturned nostrils, long philtrum between nose and mouth, thin lips with downward curving angles, small mandible, thick eyebrows that nearly meet in the midline, long curly eyelashes. The body is frequently hirsute. Birthweight is low, being 2410 g (−1·5 SD) and 2660 g (−2·0 SD) here. Height falls gradually below the centiles, with sitting height worse affected than leg length, especially in 121. Biacromial and biiliac diameters are reduced to the same degree as height. Triceps skinfold is at about the 5th in 121 but near the 60th in 122. Skeletal maturity in 122 (unavailable in 121) is initially at the 50th but falls later to the 25th.

Subjects 123 and 124, a girl and a boy, have a shortening of the trunk, not legs, the opposite of achondroplasia and hypochondroplasia. Diagnoses are uncertain, but they probably have spondyloepiphyseal dysplasia of the late-occurring and mild type described by Lenz (see Rimoin, 1975; Bailey, 1973).

Heights of both subjects (Figs 1, 4) are much below the 3rd centile due to reduction of sitting height. Leg length is around the 10th centile (except during a later puberty in the boy). The difference between the SDs of leg length and sitting height lies outside the limits of normal. The boy's adolescence is normal, with peak height velocity about 2·5 years late, but of nearly average amount. In both subjects, biacromial and biiliac are consonant with sitting height rather than leg length, so the whole trunk is reduced in size. Skeletal maturity is a little below the 3rd centile in the boy, and is between the 3rd and 10th in the girl. In neither was there any family history of shortness. The radiographic appearances were not diagnostic though probably abnormal.

Subject 125 is a girl with Marfan's Syndrome (McKusick, 1972; Smith, 1976, p. 276). This is an autosomal dominant condition with tall stature, due chiefly to long limbs, joint laxity, subluxation of the lens, glaucoma, myopia, bluish sclerae and frequently a dissecting aneurysm of the aorta. The symptoms are the result of abnormal metabolism of a mucopolysaccharide, with excess excretion of keratin sulphate in urine, though the exact nature of the enzyme defect is unknown. The height curve is above the 97th centile throughout; height velocity is about the 50th and reaches adolescent peak at about average time with an average peak value. The excess height is almost entirely in the legs; sitting height is at the +1 SD level throughout, whereas leg length, even at age 8, is far above the standards. This subject's mature height was at the top point of her parental target; her father, who had the same centile position, also had the syndrome. Biacromial and biiliac are proportionate to sitting height rather than leg length; the former rises from the 50th to about the 75th and the latter from the 75th to the 90th. Weight is low for height, rising from the 75th to the 90th, and triceps skinfold rises from the 50th to the 75th soon after menarche.



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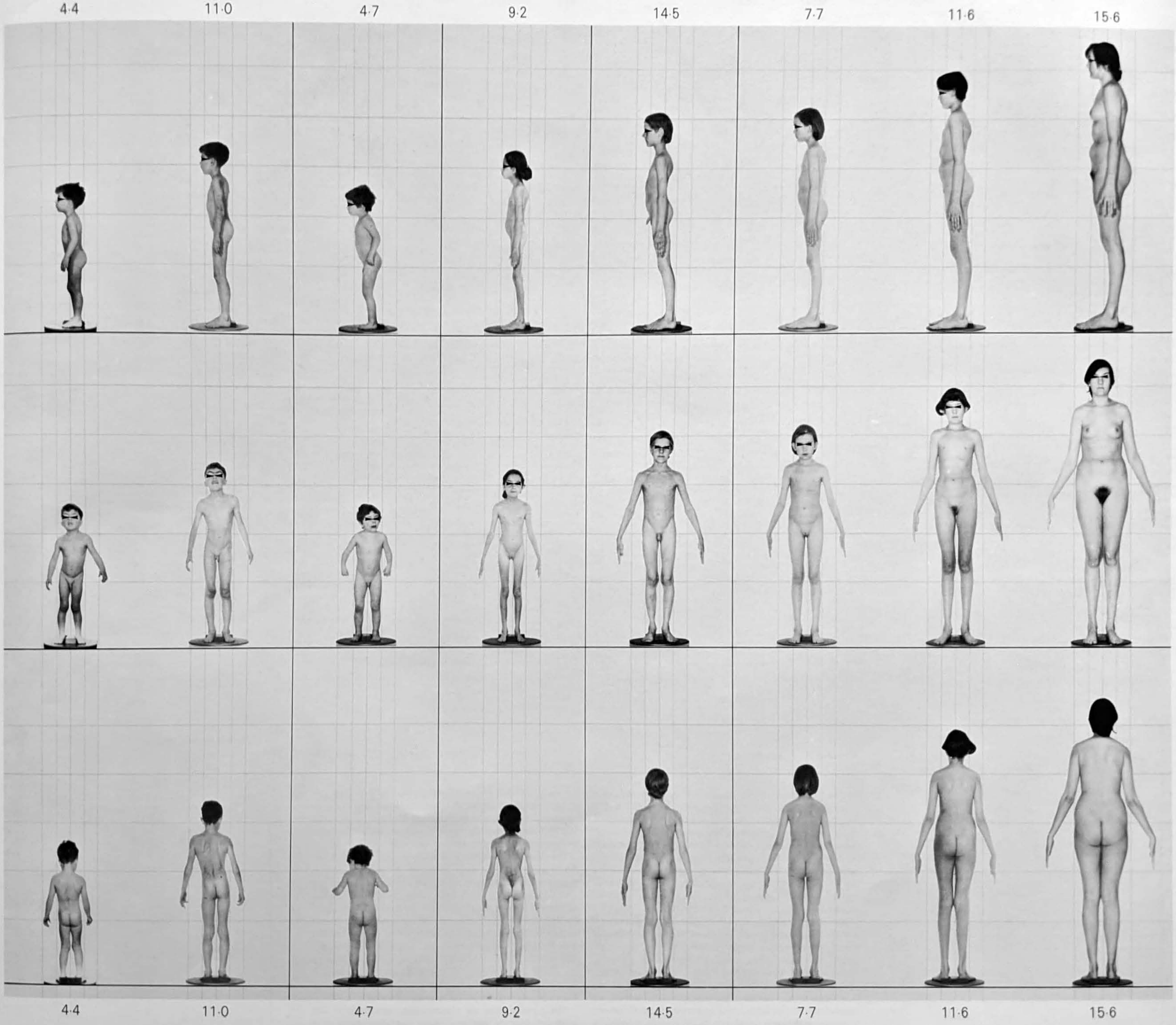
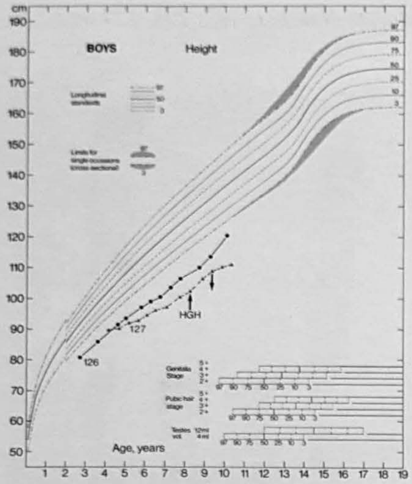


Age, years Subject no. 121. Subject no. 122. Subject no. 123. Subject no. 124. Subject no. 125.

Subjects 121 and 122 show the characteristic facial appearance of Delange's Syndrome; the problems of posing reflect the mental handicap. Subjects 123 and 124 show the short trunk in relation to legs; in the girl there is an unusual growth of hair at the base of the spine extending up the back; this is a family characteristic. Subject 125 shows the tall, highly ectomorphic physique (in contrast to the subject with Sotos' Syndrome on p. 191).



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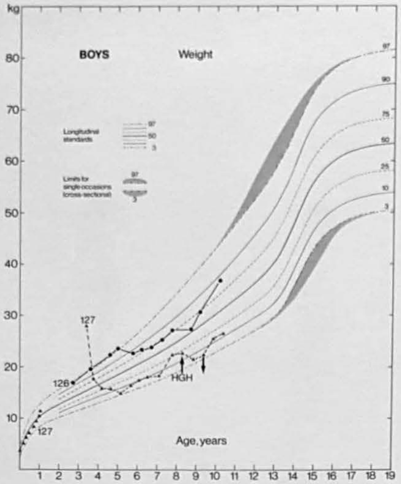


Fig. 2.

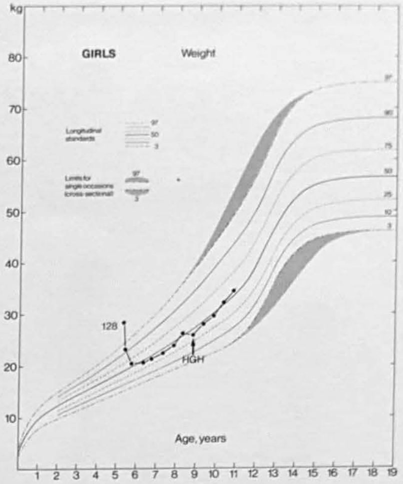
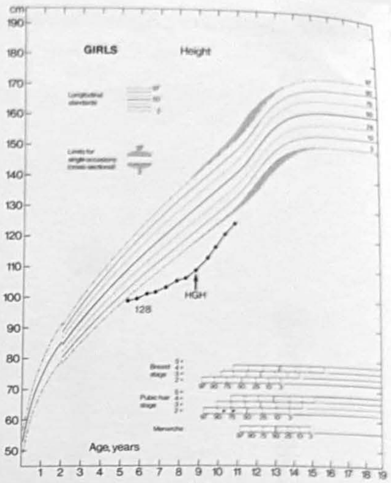


Fig. 3.



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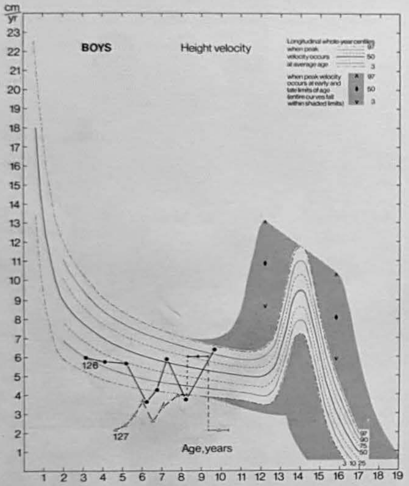

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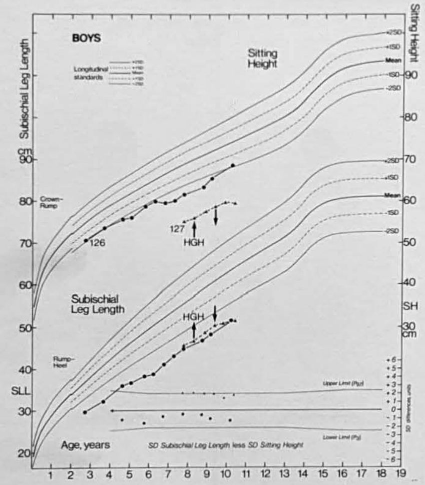

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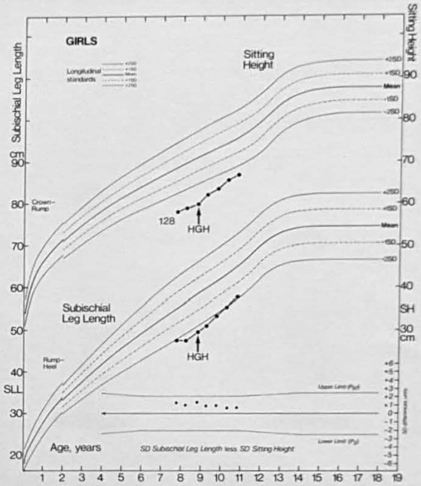

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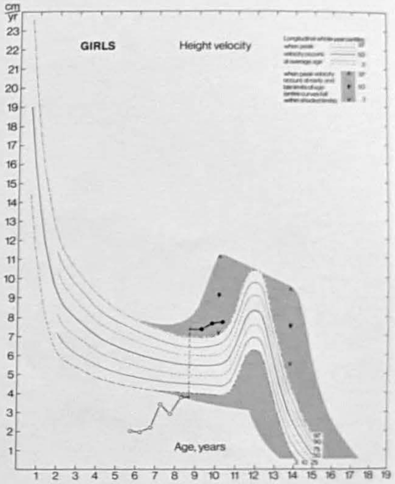

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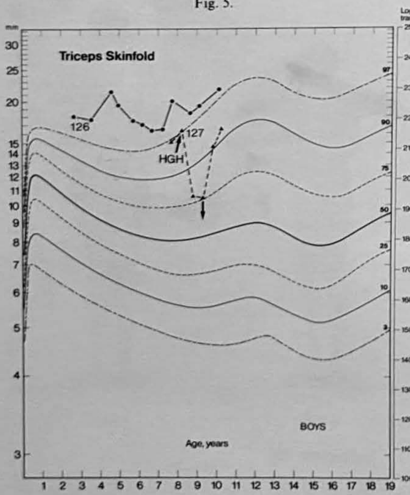


Fig. 9.

Prader–Willi Syndrome

Subjects Nos 126, 127 and 128

Two boys and a girl with the Prader–Willi Syndrome (Prader *et al.*, 1956). This syndrome is characterized by hypotonia in early infancy ("floppy baby"), short stature from birth or before, increasing obesity starting in the pre-school years, mental deficiency and, in males, a small penis and usually undescended testes. The face is distinctive, with a narrow forehead diameter, almond-shaped, often slanting eyes, and eyelids retracted behind the canthal fold. All our three subjects have this facial appearance. The cause of the disorder is unknown and its occurrence usually sporadic, as in these three.

Birthweight is below average in all three subjects and beyond the limits of normal in two, SD scores adjusted for length of gestation and mother's height being −2·1, −0·7 and −2·6. Height curves show a gradual falling away from the standards, except in the case of no. 126 from 9 to 10 (Fig. 1) and in no. 128, the girl, when given growth hormone as an experimental trial (Fig. 4). In no. 126 the reduction in height is due more to leg length deficit than deficit in sitting height (Fig. 6) but the reverse is the case in the other two (Figs 6, 7). On average, therefore, it seems the reduction is proportionate, as in growth hormone deficiency. It is usually believed these children have a normal growth hormone secretion, but in obese children the response of growth hormone to insulin hypoglycaemia is depressed so that the matter remains in some doubt. It certainly looks from the height velocity charts as if HGH administration causes a substantial increase in the girl's growth (Fig. 8), though in the boy who was treated (Fig. 5) the increase resembled more the transient effect seen in Turner's Syndrome (p. 170).

The weight charts show a huge gain in no. 127 from age 1·5 to 3·5 (Fig. 2). Very strenuous measures, including prolonged hospitalization, brought the weight down again and it has stayed within the standard centiles since, though of course it remains abnormally high for height. The other boy has a weight at about the 95th centile (Fig. 2). The girl had the same drastic dietary treatment as no. 127 and then remained on the 50th centile (Fig. 3). Triceps skinfolds are all very high, around the 90th and 97th centiles (Figs 9, 10). Skeletal maturity is at first delayed in no. 126, then at the 50th; in no. 128 it is at the 3rd centile. Biacromial diameters are a little below the 3rd centile and biiliac diameters, bolstered by the fat, approach the 50th.

The pictures show the characteristic appearance in this syndrome, and the bad positioning that often occurs in a mentally handicapped child. One of the boys, no. 127, is cryptorchid, but the other, no. 126, has pre-pubertal testes palpable in the scrotum; in both the penis is tiny. All three subjects have rather severe knock knees.

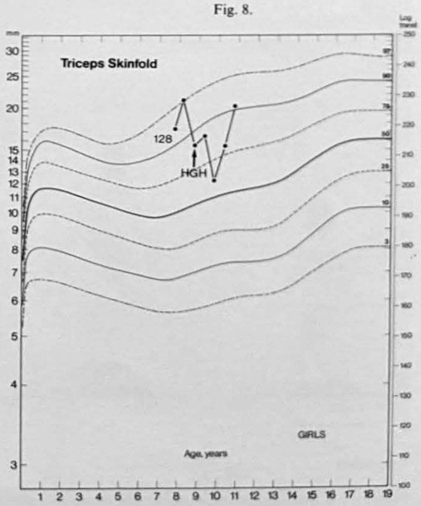
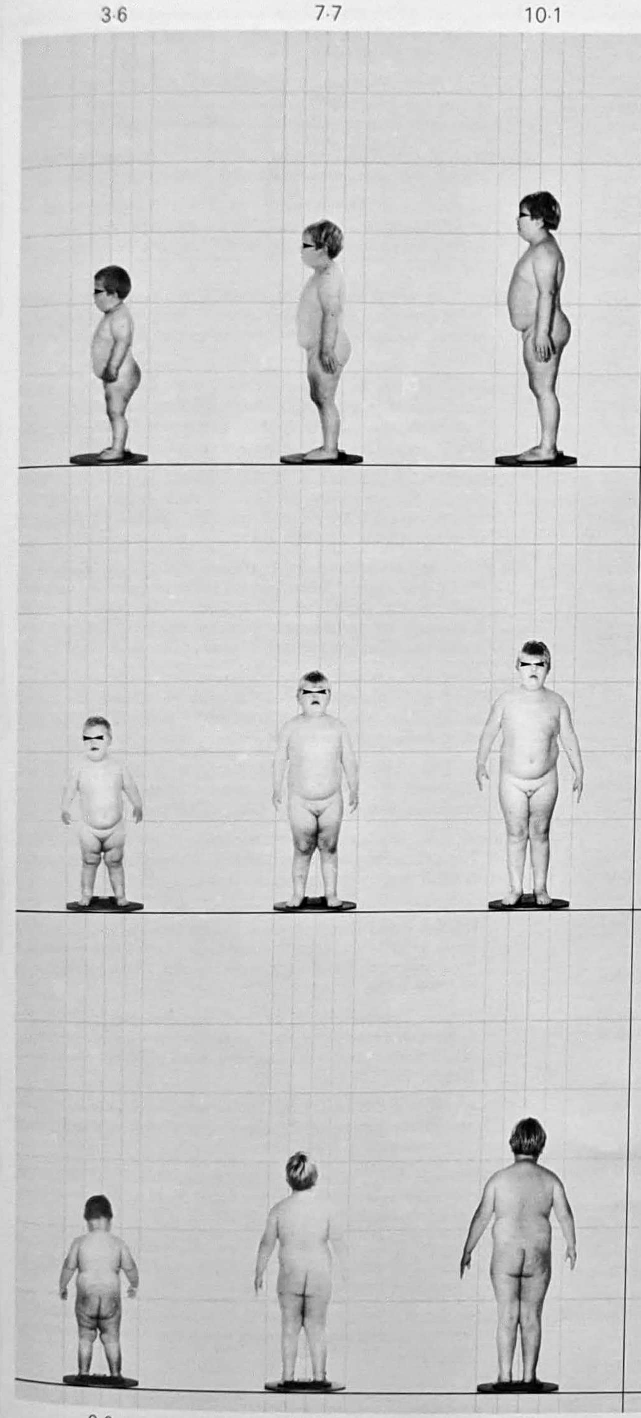
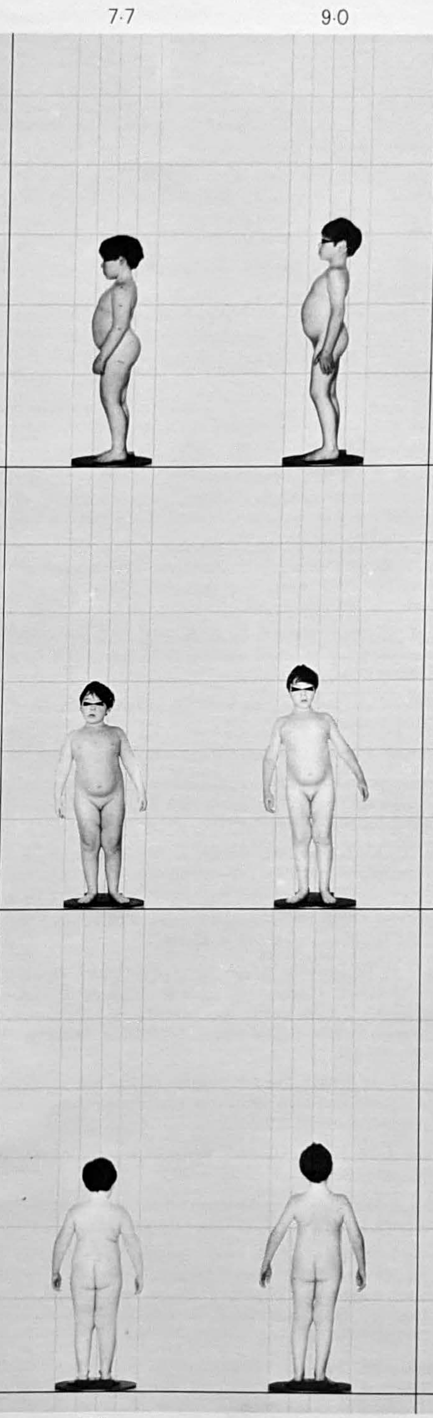


Fig. 10.

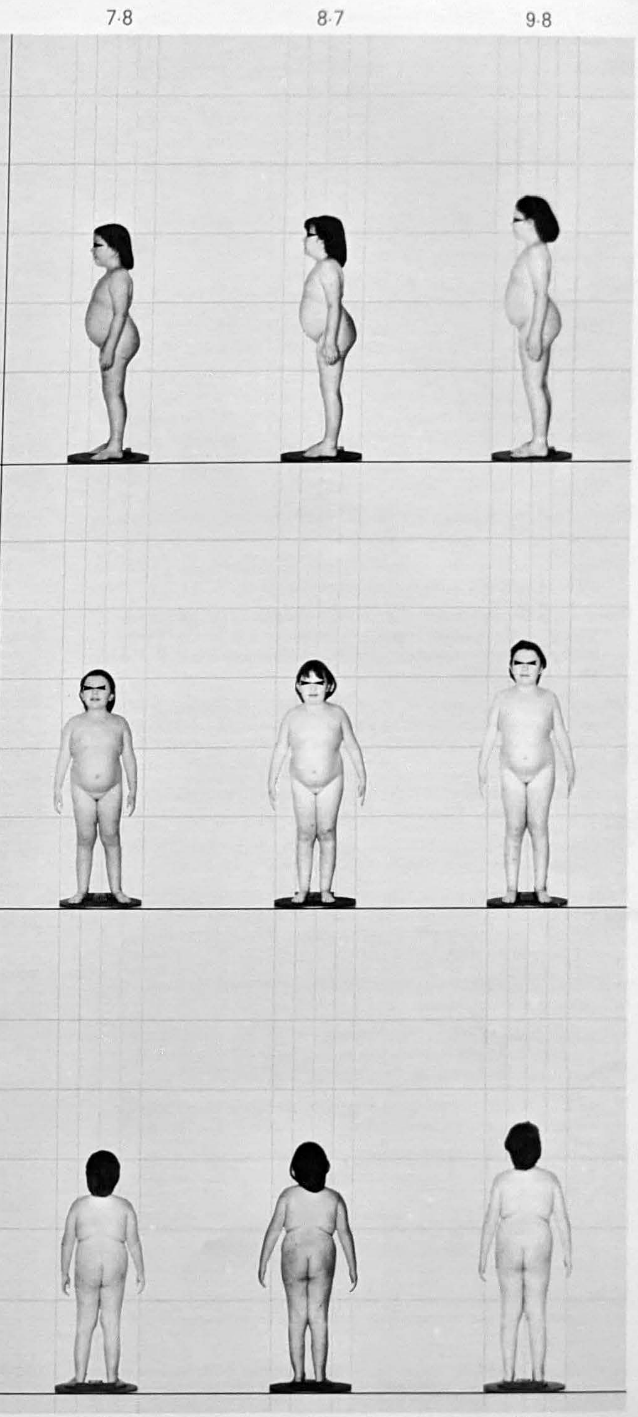


Age, years

Subject no. 126.



Subject no. 127.



Subject no. 128.

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AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
NO. 1 NORMAL MALE SOMATOTYPE:2.5,4.0,4.0																	
1.53	811	508	303	192	137	129	111	***	***	***	***	30	1.7	179	1.1	1	1
2.01	861	530	331	197	147	135	125	***	***	***	***	55	2.1	181	1.4	1	1
2.51	915	552	363	211	155	145	138	***	***	***	***	***	****	***	****	1	1
3.01	965	577	388	221	162	155	152	***	***	58	83	120	3.6	192	2.5	1	1
3.49	1002	583	419	229	166	160	156	***	***	56	61	133	4.0	192	2.5	1	1
4.01	1044	610	434	237	171	170	172	***	***	60	81	153	4.6	222	3.9	1	1
4.52	1072	610	462	244	176	177	179	180	334	57	87	170	5.2	261	4.6	1	1
5.02	1114	631	483	247	181	181	193	177	328	51	68	***	****	***	****	1	1
5.44	1146	650	496	254	187	188	204	184	343	61	75	189	5.9	291	5.1	1	1
6.00	1173	658	515	261	194	195	211	180	335	55	73	216	7.0	370	6.1	1	1
6.54	1202	663	539	267	199	200	222	185	342	61	73	239	7.7	455	7.1	1	1
7.02	1236	679	557	273	204	202	230	183	347	53	67	261	8.5	496	7.5	1	1
7.52	1264	690	574	275	206	210	248	187	360	58	71	263	8.6	552	8.2	1	1
8.13	1297	710	587	283	210	214	251	187	357	53	63	277	9.1	578	8.5	1	1
8.51	1313	713	600	287	215	218	266	194	368	53	69	***	****	***	****	1	1
9.01	1337	718	619	294	219	223	282	195	386	58	71	293	9.7	670	9.4	1	1
9.53	1362	728	634	299	223	226	292	199	391	53	64	302	10.0	755	10.3	1	1
10.02	1386	745	641	302	225	227	300	199	397	58	65	320	10.5	816	11.1	1	1
10.50	1403	744	659	308	229	232	312	200	402	55	62	348	11.5	834	11.3	1	1
11.02	1431	754	677	311	232	238	322	200	401	53	63	363	12.0	862	11.7	1	1
11.27	1440	759	681	314	234	238	326	203	410	55	62	370	12.2	900	12.3	1	1
11.50	1450	764	686	315	236	240	338	204	415	55	64	370	12.2	900	12.3	1	1
11.83	1466	770	696	318	238	242	352	209	418	55	66	376	12.3	900	12.3	1	1
12.02	1475	776	699	321	240	246	358	210	427	56	71	376	12.3	978	13.8	1	1
12.27	1482	778	704	323	241	245	364	212	424	59	69	384	12.5	978	13.8	2	1
12.52	1498	775	723	326	243	249	376	216	431	56	68	***	****	***	****	2	1
12.80	1511	784	727	330	245	252	386	222	435	63	70	384	12.5	978	13.8	2	1
13.01	1516	786	730	331	246	252	386	213	437	56	64	384	12.5	978	13.8	2	1
13.26	1536	798	738	332	249	252	397	216	440	58	71	384	12.5	978	13.8	2	1
13.51	1543	803	740	340	253	255	409	220	446	59	68	404	12.9	978	13.8	3	1
13.80	1570	812	758	342	255	261	433	226	453	62	72	413	13.1	991	14.2	3	2
14.03	1590	821	769	348	259	263	456	231	466	61	64	433	13.4	999	15.0	3	2
14.26	1618	837	781	353	263	266	473	232	470	59	63	***	****	***	****	4	3
14.49	1645	848	797	357	266	269	488	237	465	58	63	***	****	***	****	4	4
14.85	1672	866	806	362	272	271	524	243	493	71	65	***	****	***	****	5	4
15.01	1687	878	809	367	275	273	524	240	485	66	62	***	****	***	****	5	4
15.53	1711	886	825	377	278	273	554	246	486	69	65	598	15.0	999	15.0	5	4
16.01	1727	897	830	383	283	275	568	252	488	71	61	598	15.0	999	15.0	5	5
17.13	1759	924	835	394	290	278	608	262	499	80	59	***	****	***	****	5	5
18.02	1767	936	831	402	293	280	625	267	510	82	61	***	****	***	****	5	5
19.01	1778	946	832	406	297	277	638	271	500	82	57	***	****	***	****	5	5
NO. 2 NORMAL FEMALE SOMATOTYPE:6.0,3.0,1.0																	
2.57	879	531	348	206	153	133	127	***	***	57	85	120	1.9	193	2.3	1	1
2.98	900	538	362	209	160	137	143	***	***	62	101	154	2.4	***	****	1	1
3.49	946	553	393	219	165	148	152	***	***	57	85	195	3.3	270	3.7	1	1
3.97	978	567	411	230	168	151	163	170	336	70	103	197	3.3	279	3.8	1	1
4.49	1017	587	430	234	171	156	161	170	342	66	98	217	3.9	***	****	1	1
4.99	1058	604	454	243	177	160	182	170	345	65	85	231	4.3	427	5.4	1	1
5.48	1085	619	466	250	184	167	188	169	337	53	85	263	5.5	469	5.9	1	1
5.98	1115	632	483	251	189	170	188	165	345	47	82	269	5.7	522	6.5	1	1
6.50	1146	644	502	258	194	176	207	173	360	57	83	283	6.2	560	7.0	1	1
6.96	1168	654	514	261	198	180	220	175	370	61	78	313	7.2	584	7.3	1	1
7.50	1200	665	535	268	203	187	230	180	376	61	84	316	7.3	672	8.2	1	1
7.99	1222	671	551	271	209	192	247	185	396	66	94	329	7.7	779	9.2	1	1
8.49	1251	692	559	281	216	197	265	195	415	73	105	356	8.5	819	9.5	1	1
8.97	1286	702	584	288	220	202	268	187	407	68	95	364	8.7	834	9.6	1	1
9.49	1307	714	593	293	225	205	291	202	422	82	120	380	9.0	900	10.3	1	1
9.99	1333	722	611	296	228	207	293	192	422	74	102	380	9.0	915	10.5	1	1
10.49	1357	740	617	303	232	212	319	204	443	84	120	390	9.3	931	10.7	1	1
10.99	1377	748	629	308	237	212	330	205	450	92	115	434	10.0	947	10.9	2	1
11.27	1393	751	642	312	239	217	344	210	462	96	124	***	****	***	****	2	1
11.50	1405	751	654	314	242	219	350	211	460	94	123	472	10.6	968	11.3	2	1
11.77	1419	754	665	316	244	218	360	213	464	96	122	493	10.9	981	11.7	2	1
11.96	1422	755	667	317	244	222	358	210	462	91	119	493	10.9	981	11.7	2	1
12.23	1440	765	675	321	249	225	379	217	475	105	130	493	10.9	992	12.2	2	1
12.50	1456	767	689	325	253	228	404	233	494	123	143	539	11.5	992	12.2	3	1
12.77	1466	775	691	329	257	230	421	235	505	142	160	571	11.9	992	12.2	3	1
12.98	1482	780	702	334	261	232	420	228	501	107	150	585	12.0	992	12.2	3	1
13.23	1498	783	715	337	266	232	457	240	515	134	170	***	****	***	****	3	2
13.50	1520	797	723	340	269	236	467	243	526	144	165	641	12.6	999	13.0	4	3
13.76	1537	809	728	345	273	239	470	241	513	133	144	685	13.1	999	13.0	4	3
13.98	1547	812	735	348	276	239	476	234	512	122	148	685	13.1	999	13.0	4	3
14.21	1559	818	741	352	280	239	491	240	520	116	140	688	13.1	999	13.0	4	4
14.49	1574	824	750	356	284	239	526	255	550	135	180	712	13.4	999	13.0	4	4
14.76	1582	835	747	359	290	241	564	260	567	178	203	719	13.4	999	13.0	4	4
14.95	1589	838	751	362	290	242	578	268	577	165	195	752	13.7	999	13.0	4	4
15.24	1597	846	751	365	293	243	598	272	583	162	210	774	13.9	999	13.0	4	4
15.49	1600	847	753	366	297	242	623	280	596	235	240	824	14.4	999	13.0	4	4
15.78	1599	853	746	369	298	241	644	283	604	244	240	858	14.7	999	13.0	4	4
15.99	1602	853	749	370	302	241	638	284	602	244	240	***	****	***	****	5	5
19.93	1612	854	758	368	306	239	586	262	562	140	157	***	****	***	****	5	5
NO. 3 NORMAL MALE SOMATOTYPE:2.5,5.5,2.5																	
5.02	1117	645	472	264	***	***	204	***	***	***	***	144	4.3	280	4.9	1	1
5.51	1153	653	500	270	185	***	215	***	***	***	***	159	4.8	280	4.9	1	1
6.01	1186	667	519	277	189	***	225	***	***	***	***	190	5.9	304	5.3	1	1
6.51	1218	685	533	287	192	***	245	***	***	***	***	199	6.3	377	6.2	1	1
7.01	1251	703	548	289	198	190	240	***	***	***	***	205	6.5	403	6.6	1	1
7.54	1288	721	567	296	202	191	272	***	***	***	***	245	7.9	483	7.4	1	1
8.00	1312	728	584	299	204	198	277	***	***	***	***	265	8.7	517	7.8	1	1
8.54	1341	735	606	306	208	204	293	***	***	***	***	271	8.9	572	8.4	1	1
9.00	1365	749	616	309	213	207	304	***	***	45	67	271	8.9	572	8.4	1	1
9.54	1404	761	643	317	216	212	329	***	***	52	75	300	9.9	592	8.6	1	1
10.02	1423	776	647	324	220	216	340	195	413	51	70	306	10.1	714	9.9	1	1

CONTINUED—

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
NO. 3 NORMAL MALE SOMATOTYPE:2.5,5.5,2.5																	
10.53	1447	781	666	329	225	218	356	197	423	54	72	343	11.3	732	10.1	2	1
11.01	1480	789	691	332	229	222	372	207	427	49	69	343	11.3	804	10.9	2	1
11.53	1508	797	711	342	234	233	390	208	430	49	77	343	11.3	832	11.3	2	1
12.01	1530	815	715	346	238	234	427	212	435	54	81	343	11.3	832	11.3	3	1
12.28	1544	815	729	347	240	238	409	214	439	59	80	362	11.9	832	11.3	3	1
12.55	1555	827	728	350	244	238	440	221	453	57	87	362	11.9	849	11.5	3	1
12.76	1566	824	742	357	245	245	441	223	454	55	86	368	12.1	849	11.5	3	1
13.01	1577	832	745	357	248	244	463	230	468	65	92	376	12.3	887	12.1	4	2
13.26	1598	842	756	363	252	249	489	236	476	70	84	376	12.3	887	12.1	4	2
13.54	1618	837	781	367	253	250	490	231	463	60	77	397	12.8	887	12.1	4	3
13.75	1634	849	785	371	256	262	508	233	487	58	84	405	12.9	938	12.9	4	3
14.00	1658	863	795	374	259	259	520	237	483	60	82	405	12.9	956	13.2	4	3
14.25	1683	875	808	383	266	260	566	245	498	61	80	466	13.8	978	13.8	5	4
14.56	1705	892	813	390	266	263	576	248	500	63	71	547	14.6	991	14.2	5	4
14.75	1719	899	820	394	270	269	586	255	503	63	75	547	14.6	991	14.2	5	5
15.00	1737	901	836	400	273	272	622	267	510	66	78	572	14.8	999	15.0	5	5
16.01	1785	924	861	414	280	272	651	256	521	70	75	598	15.0	999	15.0	5	5
17.01	1815	950	865	429	285	274	696	278	534	72	74	665	15.5	999	15.0	5	5
18.01	1819	957	862	433	285	273	703	265	535	72	60	936	17.1	999	15.0	5	5
19.00	1826	968	858	444	290	274	760	295	553	90	81	990	17.7	999	15.0	5	5
20.00	1840	973	867	447	291	276	780	295	575	87	74	999	18.1	999	15.0	5	5
NO. 4 NORMAL MALE SOMATOTYPE:2.5,5.5,2.0																	
3.56	980	582	398	230	***	***	188	***	***	***	***	***	****	***	****	1	1
4.05	1016	599	417	237	189	***	195	***	***	***	***	***	****	***	****	1	1
4.55	1044	618	426	240	195	***	200	***	***	***	***	***	****	***	****	1	1
5.03	1076	624	452	245	198	***	204	***	***	***	***	***	****	***	****	1	1
5.54	1100	630	470	248	201	***	209	***	***	***	***	***	****	***	****	1	1
6.06	1118	642	476	254	205	179	213	***	***	***	***	***	****	***	****	1	1
6.54	1154	659	495	260	211	186	227	***	***	***	***	***	****	***	****	1	1
7.04	1193	665	528	265	217	192	234	***	***	***	***	***	****	***	****	1	1
7.54	1225	672	553	273	223	199	263	***	***	61	68	***	****	***	****	1	1
8.02	1262	693	569	281	227	202	265	***	***	43	52	267	8.8	678	9.5	1	1
8.53	1292	709	583	288	234	208	293	***	***	54	57	276	9.1	724	10.0	1	1
9.05	1320	719	601	292	239	216	304	190	399	47	53	297	9.8	755	10.3	1	1
9.55	1353	736	617	298	243	219	322	196	412	54	57	343	11.3	786	10.7	1	1
10.05	1378	750	628	301	245	225	331	193	406	53	52	348	11.5	804	10.9	1	1
10.53	1399	754	645	306	249	229	359	202	423	58	65	356	11.8	804	10.9	1	1
11.06	1432	770	662	314	256	234	368	207	428	51	58	363	12.0	837	11.4	1	1
11.54	1462	787	675	319	259	242	389	209	440	54	61	370	12.2	837	11.4	2	1
12.04	1485	798	687	322	261	247	410	215	443	51	65	394	12.8	927	12.7	2	1
12.33	1509	805	704	327	266	248	416	215	444	58	63	394	12.8	962	13.4	2	1
12.54	1514	810	704	332	267	252	435	224	469	58	66	394	12.8	978	13.8	2	1
12.79	1533	813	720	334	271	257	446	225	466	58	67	394	12.8	978	13.8	3	1
13.04	1553	828	725	338	274	260	453	220	460	54	55	394	12.8	978	13.8	3	1
13.34	1578	830	748	347	278	260	479	228	462	55	56	403	12.9	978	13.8	3	1
13.54	1590	838	752	351	283	263	502	236	486	62	63	422	13.2	991	14.2	4	2
13.78	1613	852	761	358	287	268	527	240	486	61	58	470	13.9	999	15.0	4	2
14.05	1638	866	772	363	291	270	529	241	485	57	53	589	14.9	999	15.0	4	3
14.34	1660	870	790	371	295	272	566	244	490	63	53	598	15.0	999	15.0	5	3
14.55	1681	888	793	377	298	280	595	258	512	61	57	598	15.0	999	15.0	5	4
14.80	1699	894	805	379	302	278	620	258	519	58	57	598	15.0	999	15.0	5	4
15.03	1707	899	808	386	304	278	627	260	525	56	49	598	15.0	999	15.0	5	4
16.03	1752	921	831	400	313	280	674	271	532	72	55	688	15.6	999	15.0	5	4
17.04	1770	934	836	413	319	282	700	279	532	67	53	999	18.1	999	15.0	5	5
18.12	1788	961	827	419	326	284	755	295	559	90	67	999	18.1	999	15.0	5	5
22.06	1799	970	829	425	325	286	735	299	563	100	57	***	****	***	****	5	5
NO. 5 NORMAL MALE SOMATOTYPE:3.5,5.5,1.5																	
5.48	1044	622	422	232	***	***	181	***	***	***	***	***	****	***	****	1	1
6.00	1072	634	438	244	***	***	202	***	***	***	***	***	****	***	****	1	1
6.50	1110	646	464	248	***	***	206	***	***	***	***	233	7.6	310	5.4	1	1
7.00	1129	650	479	250	193	***	213	***	***	***	***	236	7.6	320	5.5	1	1
7.49	1157	664	493	254	199	***	215	***	***	***	***	239	7.8	380	6.2	1	1
7.97	1179	677	502	255	201	***	229	***	***	***	***	245	7.9	434	6.9	1	1
8.49	1212	689	523	261	206	***	245	***	***	***	***	250	8.1	482	7.4	1	1
9.01	1236	704	532	268	212	194	263	***	***	***	***	263	8.6	556	8.2	1	1
9.49	1262	711	551	275	214	202	281	***	***	***	***	282	9.3	598	8.7	1	1
9.98	1284	720	564	277	219	204	290	***	***	***	***	282	9.3	685	9.6	1	1
10.49	1307	731	576	282	221	210	308	***	***	49	65	333	11.0	742	10.2	1	1
10.96	1336	746	590	286	226	215	322	***	***	52	77	350	11.6	787	10.7	1	1
11.48	1353	754	599	289	229	220	345	***	***	59	74	358	11.8	820	11.1	1	1
12.00	1377	762	615	295	232	225	356	220	453	56	87	358	11.9	***	****	1	1
12.49	1400	766	634	298	236	232	368	223	448	57	78	371	12.2	875	11.9	2	1
12.99	1418	774	644	299	237	232	400	232	463	64	87	***	****	***	****	2	1
13.47	1440	779	661	312	241	236	413	236	480	71	92	394	12.8	962	13.4	2	1
14.01	1461	783	678	315	247	244	434	244	483	73	97	423	13.2	962	13.4	2	1
14.49	1476	788	688	316	253	246	461	247	499	76	97	474	13.9	978	13.8	2	1
14.99	1510	800	710	322	254	250	479	251	500	74	102	575	14.8	999	15.0	2	1
15.27	1523	809	714	325	256	253	478	252	496	72	93	598	15.0	999	15.0	2	1
15.49	1529	813	716	327	256	258	476	252	495	61	82	598	15.0	999	15.0	3	2
15.74	1547	814	733	330	259	258	482	249	485	53	72	***	****	***	****	3	3
15.98	1566	817	749	336	265	261	511	251	493	55	61	598	15.0	999	15.0	4	3
17.00	1638	860	778	362	279	267	578	282	515	65	57	605	15.0	999	15.0	5	4
19.11	1674	894	780	383	290	268	670	313	566	84	78	999	18.1	999	15.0	5	5
NO. 6 NORMAL MALE SOMATOTYPE:2.0,5.5,3.0																	
5.57	1116	631	485	250	154	176	186	160	338	42	59	227	7.4	471	7.3	*	*
6.02	1142	634	508	255	155	182	186	162	330	40	49	231	7.5	518	7.8	*	*
6.56	1175	652	523	266	159	187	202	169	339	38	50	243	7.9	534	8.0	*	*
7.04	1206	663	543	273	163	191	211	170	350	39	43	255	8.3	579	8.5	*	*
7.56	1230	672	558	282	165	197	228	175	355	43	49	261	8.6	618	8.9	*	*
8.04	1247	681	566	284	170	200	234	183	363	41	45	300	9.9	645	9.2	*	*

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AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
NO. 6 NORMAL MALE SOMATOTYPE:2.0,5.5,3.0																	
8.58	1279	691	588	291	171	206	245	180	365	40	43	328	10.8	680	9.5	*	*
9.07	1303	701	602	295	173	210	256	183	378	40	37	335	11.1	694	9.7	*	*
9.58	1320	705	615	302	177	210	271	187	385	42	42	335	11.1	719	10.0	*	*
10.03	1338	710	628	305	180	216	279	192	390	42	41	335	11.1	787	10.7	*	*
10.57	1371	722	649	311	181	221	301	195	404	44	46	***	****	***	****	*	*
11.03	1387	728	659	317	186	225	305	198	403	44	43	359	11.9	853	11.6	*	*
11.30	1390	733	657	317	187	228	316	203	412	43	48	365	12.1	887	12.1	*	*
11.57	1406	735	671	324	185	228	323	200	412	44	45	365	12.1	887	12.1	*	*
11.78	1413	733	680	322	186	230	322	196	404	40	42	***	****	***	****	*	*
12.01	1418	736	682	323	188	231	322	201	402	43	40	381	12.5	909	12.4	*	*
12.29	1428	742	686	325	189	234	333	204	411	44	42	386	12.6	909	12.4	*	*
12.56	1432	739	693	327	192	233	342	202	421	44	47	394	12.8	909	12.4	*	*
12.75	1442	753	689	333	199	236	349	202	419	42	40	394	12.8	956	13.2	*	*
13.04	1456	751	705	330	193	236	348	205	410	44	39	407	13.0	956	13.2	*	*
13.29	1470	757	713	335	196	239	366	207	424	45	39	407	13.0	956	13.2	*	*
13.58	1482	762	720	336	198	239	371	214	428	46	42	407	13.0	956	13.2	*	*
13.79	1491	771	720	339	198	243	383	204	434	42	40	***	****	***	****	*	*
14.04	1507	782	725	342	204	247	391	217	435	52	42	***	****	***	****	*	*
14.29	1517	781	736	343	205	247	408	220	442	46	37	***	****	***	****	*	*
14.57	1543	790	753	352	210	250	431	224	458	51	41	***	****	***	****	*	*
14.78	1553	794	759	356	210	253	445	229	459	48	40	***	****	***	****	*	*
15.03	1572	808	764	360	212	255	464	236	463	55	46	***	****	***	****	*	*
15.57	1614	826	788	375	220	257	515	248	489	62	47	***	****	***	****	*	*
16.09	1645	855	790	381	223	258	548	252	498	67	47	***	****	***	****	*	*
16.57	1670	877	793	387	230	260	566	257	509	67	50	***	****	***	****	*	*
17.03	1684	878	806	393	229	262	588	263	510	72	52	***	****	***	****	*	*
18.10	1697	897	800	401	235	262	613	272	529	81	54	***	****	***	****	*	*
19.08	1703	901	802	408	233	264	638	284	539	90	61	***	****	***	****	*	*
20.06	1704	888	816	406	237	265	618	274	525	78	52	***	****	***	****	*	*
NO. 7 NORMAL MALE SOMATOTYPE:3.5,5.5,2.0																	
7.97	1243	701	542	275	209	***	263	***	***	***	***	273	9.0	774	10.6	1	1
8.46	1264	704	560	278	212	***	288	***	***	***	***	273	9.0	787	10.7	1	1
8.96	1297	719	578	283	218	***	295	***	***	***	***	277	9.2	826	11.2	1	1
9.44	1318	734	584	288	221	214	304	***	***	***	***	306	10.1	855	11.6	1	1
9.98	1342	738	604	294	227	218	331	***	***	***	***	311	10.3	887	12.1	1	1
10.46	1370	750	620	300	231	221	340	***	***	***	***	339	11.2	909	12.4	2	1
10.71	1380	753	627	303	233	221	343	***	***	***	***	346	11.5	931	12.8	2	1
10.98	1392	756	636	306	239	224	349	***	***	55	59	373	12.3	931	12.8	2	1
11.26	1406	760	646	308	238	224	365	***	***	58	60	373	12.3	931	12.8	2	1
11.46	1417	770	647	311	238	228	377	***	***	60	61	431	13.4	943	13.0	3	1
11.71	1435	775	660	317	241	230	395	***	***	61	61	447	13.6	960	13.3	3	2
11.97	1452	787	665	323	246	236	406	***	***	62	62	470	13.9	978	13.8	3	2
12.26	1477	800	677	326	249	238	417	***	***	57	54	527	14.4	978	13.8	4	2
12.45	1494	809	685	333	255	240	440	220	475	64	59	544	14.5	991	14.2	4	3
12.72	1519	816	703	337	261	243	463	229	473	62	54	554	14.6	991	14.2	4	4
12.97	1539	828	711	343	260	245	490	236	487	67	56	579	14.8	999	15.0	5	4
13.26	1562	842	720	350	264	249	504	243	489	59	53	598	15.0	999	15.0	5	4
13.47	1575	858	717	353	268	247	522	242	502	68	59	598	15.0	999	15.0	5	4
13.72	1593	870	723	358	271	247	549	258	523	73	60	598	15.0	999	15.0	5	4
13.96	1596	874	722	362	273	249	570	259	525	73	57	613	15.1	999	15.0	5	5
14.25	1607	882	725	364	275	251	568	254	520	68	55	659	15.4	999	15.0	5	5
14.46	1612	883	729	366	276	251	586	260	529	75	59	693	15.7	999	15.0	5	5
14.98	1624	892	732	372	281	252	613	270	534	81	63	890	16.8	999	15.0	5	5
15.44	1634	895	739	373	284	253	614	262	533	80	57	991	17.8	999	15.0	5	5
15.98	1639	895	744	373	285	252	598	270	530	78	52	999	18.1	999	15.0	5	5
16.97	1642	900	742	376	287	253	612	265	532	84	57	***	****	***	****	5	5
17.97	1644	903	741	379	290	253	618	269	537	88	57	999	18.1	999	15.0	5	5
18.97	1646	905	741	386	289	252	632	279	539	92	55	999	18.1	999	15.0	5	5
19.98	1646	904	742	385	289	253	610	271	529	90	51	***	****	***	****	5	5
NO. 8 NORMAL MALE SOMATOTYPE:3.0,5.0,2.0																	
4.99	1131	652	479	255	183	***	218	***	***	***	***	183	5.7	308	5.4	1	1
5.47	1159	668	491	257	187	181	231	***	***	***	***	200	6.3	342	5.8	1	1
6.01	1186	671	515	270	187	188	234	***	***	***	***	205	6.5	356	6.0	1	1
6.49	1211	687	524	273	192	188	243	***	***	***	***	209	6.7	428	6.9	1	1
7.01	1248	700	548	282	194	194	252	***	***	43	60	242	7.9	434	6.9	1	1
7.49	1266	714	552	283	198	196	268	***	***	43	69	250	8.1	491	7.5	1	1
8.00	1300	722	578	291	203	204	286	***	***	44	64	250	8.1	501	7.6	1	1
8.48	1320	739	581	293	206	206	281	200	406	49	84	250	8.1	517	7.8	1	1
9.00	1356	749	607	301	208	214	322	203	406	46	66	263	8.6	537	8.0	1	1
9.50	1376	759	617	304	213	214	336	213	424	53	90	266	8.7	556	8.3	1	1
10.00	1402	766	636	315	217	223	347	205	425	46	81	310	10.2	644	9.2	1	1
10.50	1429	785	644	314	220	226	370	221	438	54	90	310	10.2	684	9.6	1	1
11.02	1453	790	663	323	225	231	391	222	457	56	92	325	10.7	719	10.0	2	1
11.48	1474	803	671	325	227	233	424	243	475	65	94	343	11.3	719	10.0	2	1
12.01	1504	814	690	332	228	236	422	233	460	57	74	348	11.5	778	10.6	3	1
12.28	1515	820	695	336	232	240	437	233	464	58	88	355	11.7	800	10.9	3	2
12.51	1530	828	702	339	233	242	444	239	461	53	82	361	11.9	877	11.9	3	2
12.74	1541	832	709	340	234	244	433	233	464	47	67	376	12.3	909	12.4	3	3
13.01	1552	833	719	346	237	246	447	233	468	53	77	376	12.3	909	12.4	3	3
13.27	1563	840	723	349	237	246	461	237	468	51	77	396	12.8	909	12.4	4	3
13.49	1577	845	732	353	238	248	455	231	460	46	76	406	13.0	931	12.8	4	4
13.75	1588	849	739	354	240	251	477	238	474	49	72	414	13.1	931	12.8	4	4
14.01	1602	850	752	359	243	257	471	236	461	47	62	487	14.0	962	13.4	4	4
14.27	1622	861	761	365	245	257	511	244	478	54	70	536	14.5	991	14.2	4	4
14.50	1635	867	768	371	250	258	535	250	498	56	78	546	14.6	991	14.2	5	4
14.75	1652	872	780	374	251	260	551	263	499	61	73	568	14.7	991	14.2	5	4
15.00	1664	877	787	382	254	266	573	262	504	62	67	598	15.0	991	14.2	5	5
16.02	1705	900	805	399	266	268	646	286	542	74	81	611	15.1	991	14.2	5	5
17.09	1724	919	805	411	265	270	664	283	537	66	64	906	16.9	999	15.0	5	5
18.01	1730	929	801	416	267	272	689	294	543	73	71	982	17.6	999	15.0	5	5
19.01	1738	930	808	419	271	270	711	302	560	77	68	999	18.1	999	15.0	5	5
20.00	1738	931	807	426	274	267	700	304	552	72	66	999	18.1	999	15.0	5	5
24.98	1742	940	802	434	277	268	755	315	568	85	67	***	****	***	****	5	5

NO. 9 NORMAL MALE SOMATOTYPE:3.0,5.0,4.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
5.58	1170	647	523	246	195	***	234	***	***	***	***	181	5.6	462	7.2	1	1
5.96	1186	655	531	250	196	181	240	***	***	***	***	191	6.0	489	7.4	1	1
6.50	1218	667	551	253	202	187	243	***	***	***	***	234	7.6	489	7.4	1	1
6.98	1246	671	575	256	206	191	261	***	***	***	***	245	8.0	528	7.9	1	1
7.50	1284	684	600	267	210	198	265	***	***	48	54	254	8.3	597	8.7	1	1
7.98	1314	700	614	271	213	204	290	***	***	52	72	265	8.7	616	8.9	1	1
8.49	1347	719	628	275	219	210	299	***	***	41	58	284	9.4	699	9.8	1	1
8.97	1370	728	642	277	225	213	322	195	408	57	65	288	9.5	774	10.6	1	1
9.49	1404	734	670	288	229	221	334	196	410	53	61	343	11.3	804	10.9	1	1
9.99	1436	752	684	291	233	222	343	205	414	50	67	348	11.5	804	10.9	1	1
10.58	1470	761	709	298	238	229	365	203	418	55	64	348	11.5	853	11.6	2	1
10.98	1482	763	719	298	241	232	386	209	422	55	74	***	****	***	****	2	1
11.50	1511	777	734	306	245	236	390	210	422	60	69	348	11.5	878	12.0	3	1
11.97	1531	784	747	310	247	237	421	219	454	54	74	361	11.9	922	12.6	3	1
12.50	1565	793	772	315	251	245	436	223	452	62	74	419	13.2	978	13.8	3	1
12.77	1575	803	772	318	255	249	460	225	461	66	83	429	13.3	978	13.8	3	1
13.00	1591	818	773	320	258	250	455	225	469	63	67	437	13.5	***	****	4	1
13.23	1605	821	784	325	260	256	474	229	467	62	65	467	13.8	978	13.8	4	1
13.49	1627	835	792	335	265	260	504	237	475	65	69	487	14.0	987	14.1	4	2
13.76	1653	851	802	341	270	264	535	240	485	63	70	549	14.6	999	15.0	4	3
13.97	1676	859	817	346	273	265	543	241	485	59	63	567	14.7	999	15.0	5	3
14.24	1700	872	828	353	277	267	572	254	488	58	61	577	14.8	999	15.0	5	4
14.49	1727	892	835	359	280	269	594	256	511	68	60	598	15.0	999	15.0	5	4
14.76	1740	897	843	365	287	269	626	262	518	73	63	598	15.0	999	15.0	5	5
14.99	1753	905	848	369	289	270	643	263	518	71	63	626	15.2	999	15.0	5	5
15.49	1773	920	853	374	291	270	641	263	514	76	64	653	15.4	999	15.0	5	5
15.99	1785	933	852	379	295	271	673	268	530	82	75	815	16.4	999	15.0	5	5
16.96	1798	935	863	384	299	270	684	275	532	83	80	999	18.1	999	15.0	5	5
18.98	1805	936	869	393	302	275	710	293	525	72	69	999	18.1	999	15.0	5	5
19.95	1808	946	862	396	303	275	720	298	538	89	70	999	18.1	999	15.0	5	5

NO.10 NORMAL MALE SOMATOTYPE:4.0,5.0,2.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
4.00	999	578	421	227	173	***	166	***	***	***	***	99	3.0	226	4.0	1	1
4.50	1027	604	423	227	178	***	179	***	***	***	***	114	3.4	226	4.0	1	1
4.98	1071	620	451	242	183	***	193	***	***	***	***	142	4.3	***	****	1	1
5.49	1113	634	479	247	187	***	204	***	***	***	***	157	4.8	314	5.4	1	1
6.01	1144	640	504	256	193	174	209	***	***	***	***	179	5.5	314	5.4	1	1
6.59	1180	657	523	259	197	181	225	***	***	***	***	205	6.5	422	6.8	1	1
6.99	1206	667	539	268	203	184	231	***	***	***	***	239	7.8	430	6.9	1	1
7.63	1240	684	556	273	206	188	247	***	***	52	67	252	8.2	492	7.5	1	1
7.97	1260	691	569	279	209	192	256	***	***	50	63	265	8.7	518	7.8	1	1
8.49	1285	711	574	281	212	197	268	***	***	50	57	305	10.1	518	7.8	1	1
9.00	1309	709	600	286	215	201	279	187	378	50	53	305	10.1	610	8.8	1	1
9.50	1337	727	610	288	218	205	297	187	381	53	58	328	10.8	610	8.8	1	1
10.00	1362	742	620	298	221	210	306	195	392	58	60	328	10.8	701	9.8	1	1
10.48	1377	751	626	301	224	213	325	198	410	56	67	351	11.6	733	10.1	1	1
11.01	1396	756	640	309	227	219	331	206	408	57	65	356	11.8	804	10.9	2	1
11.49	1421	761	660	315	230	224	352	209	420	57	74	356	11.8	843	11.4	3	1
12.61	1481	789	692	330	238	232	406	225	446	77	85	386	12.6	922	12.6	3	1
12.74	1487	794	693	326	238	236	404	224	448	61	79	386	12.6	922	12.6	3	1
12.99	1505	795	710	330	241	239	415	223	446	63	71	394	12.8	943	13.0	4	1
13.29	1535	816	719	339	247	244	449	228	464	61	73	***	****	***	****	4	2
13.49	1552	819	733	344	252	246	462	233	471	61	71	463	13.8	971	13.6	4	3
13.73	1576	832	744	350	257	248	488	236	476	66	75	503	14.1	987	14.1	4	3
14.00	1603	852	751	357	263	255	519	247	483	58	70	573	14.8	999	15.0	5	4
14.98	1679	901	778	384	278	260	608	268	522	86	84	606	15.0	999	15.0	5	5
15.98	1713	932	781	394	285	259	659	280	535	93	88	852	16.6	999	15.0	5	5
16.99	1727	938	789	408	289	264	687	287	552	105	97	925	17.0	999	15.0	5	5
17.99	1734	957	777	413	295	265	706	301	548	106	97	999	18.1	999	15.0	5	5

NO.11 NORMAL MALE SOMATOTYPE:3.0,4.5,3.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
6.50	1169	667	502	253	190	***	229	***	***	***	***	191	6.0	233	4.2	1	1
7.00	1194	679	515	254	195	***	238	***	***	***	***	194	6.1	233	4.2	1	1
7.49	1215	684	531	257	198	***	250	***	***	***	***	221	7.1	233	4.2	1	1
7.99	1245	692	553	262	199	188	252	***	***	***	***	221	7.1	269	4.7	1	1
8.49	1278	706	572	270	206	194	261	***	***	***	***	249	8.1	326	5.6	1	1
8.97	1297	715	582	274	206	197	265	***	***	***	***	256	8.4	399	6.5	1	1
9.49	1327	727	600	277	209	201	281	***	***	49	64	256	8.4	449	7.0	1	1
9.99	1348	742	606	278	212	207	293	***	***	47	63	263	8.6	545	8.1	1	1
10.49	1367	746	621	282	213	213	311	***	***	48	82	269	8.9	607	8.8	1	1
10.98	1389	753	636	287	214	214	322	205	410	54	77	317	10.4	632	9.0	1	1
11.50	1414	758	656	296	218	217	334	205	412	50	67	325	10.7	729	10.1	1	1
11.98	1435	772	663	297	225	221	341	206	416	51	73	331	10.9	786	10.7	1	1
12.50	1453	774	679	299	228	226	359	210	420	52	66	331	10.9	786	10.7	2	1
13.00	1475	780	695	299	233	232	370	210	423	53	77	362	12.0	833	11.3	2	1
13.50	1488	781	707	302	233	236	370	215	421	55	77	362	12.0	833	11.3	2	1
13.74	1497	789	708	305	234	237	391	216	441	57	73	376	12.3	846	11.5	2	1
14.00	1512	790	722	308	235	237	396	218	438	49	73	427	13.3	863	11.7	3	1
14.21	1523	794	729	308	236	239	406	222	443	58	83	469	13.8	885	12.1	3	1
14.49	1532	798	734	312	240	247	427	228	455	56	80	487	14.0	922	12.6	4	2
14.74	1553	811	742	311	243	247	435	227	444	52	71	497	14.1	922	12.6	4	3
14.99	1577	819	758	326	248	250	465	233	464	57	66	528	14.4	943	13.0	4	4
15.20	1594	826	768	330	251	254	480	236	470	60	63	577	14.8	969	13.5	5	4
15.98	1648	869	779	351	264	259	530	248	484	58	70	598	15.0	999	15.0	5	4
17.00	1689	895	794	366	269	260	569	258	500	61	65	676	15.5	999	15.0	5	5
18.00	1705	918	787	376	275	259	620	279	523	70	75	959	17.3	999	15.0	5	5
19.07	1710	908	802	384	277	263	649	287	529	76	80	999	18.1	999	15.0	5	5
20.01	1720	924	796	389	281	262	656	289	546	80	89	999	18.1	999	15.0	5	5
27.39	1725	932	793	389	279	257	654	295	525	90	82	***	****	***	****	5	5

NO.12 NORMAL MALE SOMATOTYPE:3.0,4.5,2.5

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
4.48	933	560	373	215	165	***	166	***	***	***	***	114	3.4	202	3.0	1	1
4.98	978	573	405	228	173	***	181	***	***	***	***	130	3.9	206	3.2	1	1
5.47	1013	592	421	229	174	***	181	***	***	***	***	140	4.2	206	3.2	1	1
5.97	1036	606	430	236	176	161	184	***	***	***	***	141	4.2	247	4.4	1	1
6.51	1068	617	451	240	180	169	195	***	***	***	***	177	5.5	261	4.6	1	1
6.97	1095	630	465	246	184	169	200	***	***	***	***	188	5.8	337	5.7	1	1
7.50	1133	641	492	251	188	177	209	***	***	***	***	200	6.3	357	6.0	1	1
7.97	1159	645	514	258	190	182	220	***	***	51	67	234	7.6	412	6.7	1	1
8.50	1186	668	518	261	192	187	231	***	***	53	75	236	7.7	437	6.9	1	1
8.98	1206	674	532	264	193	191	236	184	358	50	72	254	8.3	454	7.1	1	1
9.50	1237	684	553	271	197	196	252	195	368	53	71	267	8.8	524	7.9	1	1
9.98	1261	697	564	274	201	202	261	195	377	53	70	267	8.8	569	8.4	1	1
10.50	1286	706	580	281	201	208	270	200	373	52	73	274	9.1	634	9.1	1	1
10.97	1308	708	600	283	204	208	281	200	381	50	77	306	10.1	679	9.5	1	1
11.51	1323	712	611	288	206	211	293	204	393	54	73	***	****	***	****	1	1
11.97	1345	716	629	291	206	213	305	201	396	55	72	321	10.6	690	9.7	2	1
12.22	1355	721	634	293	212	218	312	203	400	49	70	339	11.2	743	10.2	2	1
12.51	1370	724	646	296	214	220	321	208	397	53	73	348	11.5	816	11.1	2	1
12.72	1379	728	651	298	215	222	325	211	409	54	76	356	11.8	816	11.1	2	1
12.97	1390	739	651	302	217	225	333	208	407	55	64	363	12.0	883	12.1	3	1
13.21	1406	746	660	303	221	228	336	215	408	50	62	370	12.2	883	12.1	3	1
13.52	1426	750	676	307	224	231	349	214	409	51	68	385	12.6	904	12.4	4	1
13.71	1438	755	683	311	228	231	355	215	420	57	67	385	12.6	904	12.4	4	1
13.96	1452	762	690	314	230	232	376	222	437	56	75	404	12.9	922	12.6	4	2
14.31	1479	781	698	324	232	238	391	222	434	53	63	483	14.0	962	13.4	4	3
14.52	1496	787	709	330	235	241	404	224	439	56	64	545	14.5	962	13.4	5	3
14.73	1518	799	719	335	236	244	427	237	448	55	58	557	14.6	978	13.8	5	4
14.98	1540	809	731	341	240	248	451	237	460	55	57	580	14.8	978	13.8	5	4
15.55	1576	832	744	355	247	247	503	253	480	65	64	589	14.9	991	14.2	5	4
15.98	1593	844	749	360	249	246	518	264	488	75	70	644	15.3	999	15.0	5	5
16.97	1617	862	755	371	255	249	549	270	497	71	55	795	16.3	999	15.0	5	5
17.97	1633	875	758	383	259	249	579	287	505	80	62	842	16.5	999	15.0	5	5
20.98	1645	884	761	393	265	252	579	278	499	94	58	***	****	***	****	5	5
25.00	1641	877	764	393	266	254	617	292	537	100	58	***	****	***	****	5	5

NO.13 NORMAL MALE SOMATOTYPE:3.5,4.5,2.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
6.05	1080	608	472	236	***	***	163	***	***	***	***	***	****	***	****	1	1
6.51	1092	612	480	238	***	***	172	***	***	***	***	***	****	***	****	1	1
7.03	1118	624	494	253	***	***	179	***	***	***	***	***	****	***	****	1	1
7.52	1149	634	515	255	***	***	195	***	***	***	***	183	5.7	296	5.2	1	1
8.02	1170	650	520	259	179	***	209	***	***	***	***	196	6.2	356	6.0	1	1
8.52	1194	664	530	265	182	***	213	***	***	***	***	200	6.3	372	6.2	1	1
9.02	1224	666	558	267	185	***	227	***	***	***	***	227	7.4	407	6.6	1	1
9.51	1244	685	559	274	187	186	231	***	***	***	***	247	8.0	467	7.2	1	1
10.05	1268	690	578	280	192	190	250	***	***	***	***	261	8.6	512	7.7	1	1
10.51	1290	706	584	287	197	193	270	***	***	***	***	265	8.7	562	8.3	1	1
11.05	1326	721	605	297	200	199	286	***	***	***	***	288	9.5	652	9.2	1	1
11.51	1348	726	622	302	208	203	322	***	***	64	78	288	9.5	727	10.0	1	1
12.05	1375	745	630	303	208	209	329	***	***	50	60	321	10.6	763	10.4	2	1
12.26	1379	746	633	305	215	210	331	***	***	48	67	339	11.2	793	10.8	2	1
12.52	1398	756	642	308	212	212	331	193	427	54	63	339	11.2	819	11.1	2	1
12.77	1407	755	652	311	212	215	333	195	415	45	61	339	11.2	819	11.1	3	1
13.04	1415	759	656	314	215	218	354	200	429	57	66	339	11.2	893	12.2	3	1
13.27	1435	763	672	317	216	218	352	200	421	47	57	347	11.5	893	12.2	3	1
13.52	1450	767	683	323	217	216	365	200	422	48	54	367	12.1	893	12.2	3	2
13.77	1464	783	681	326	221	223	381	206	442	51	56	367	12.1	922	12.6	3	2
14.04	1490	792	698	329	227	227	411	216	453	53	60	389	12.7	940	12.9	4	2
14.25	1506	801	705	335	228	229	422	214	453	52	58	425	13.3	956	13.2	4	2
14.52	1528	814	714	340	232	231	454	226	465	58	60	533	14.4	978	13.8	4	3
14.78	1557	828	729	347	233	234	461	224	471	57	54	567	14.7	978	13.8	4	4
15.05	1579	841	738	352	236	240	481	238	473	59	54	567	14.7	999	15.0	5	4
15.26	1589	848	741	358	241	242	520	244	496	63	65	580	14.8	999	15.0	5	4
15.51	1608	861	747	364	242	240	556	251	520	78	77	595	14.9	999	15.0	5	4
16.05	1630	879	751	371	246	242	582	256	514	83	67	796	16.3	999	15.0	5	5
17.06	1654	896	758	386	253	244	579	251	518	67	57	982	17.6	999	15.0	5	5
18.06	1661	907	754	388	257	244	599	248	529	81	65	999	18.1	999	15.0	5	5
19.06	1667	907	760	394	258	244	603	250	530	71	50	***	****	***	****	5	5
20.07	1667	908	759	394	256	245	609	256	536	76	56	***	****	***	****	5	5

NO.14 NORMAL MALE SOMATOTYPE:3.5,4.5,3.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
8.07	1193	647	546	270	***	***	213	***	***	***	***	***	****	***	****	1	1
8.53	1219	651	568	274	***	***	215	***	***	***	***	***	****	***	****	1	1
9.05	1245	676	569	284	***	***	236	***	***	***	***	***	****	***	****	1	1
9.54	1281	684	597	288	***	***	259	***	***	***	***	338	11.2	648	9.2	1	1
10.04	1310	703	607	295	202	***	259	***	***	***	***	345	11.4	664	9.4	1	1
10.53	1334	709	625	299	205	***	281	***	***	***	***	358	11.8	775	10.6	1	1
11.03	1362	727	635	307	208	***	288	***	***	***	***	386	12.6	833	11.3	2	1
11.53	1388	744	644	313	212	215	315	***	***	***	***	386	12.6	907	12.4	2	1
11.80	1403	744	659	315	215	218	318	***	***	***	***	386	12.6	922	12.6	3	1
12.07	1424	749	675	322	218	221	333	***	***	***	***	386	12.6	943	13.0	3	1
12.28	1436	763	673	326	223	221	347	***	***	***	***	417	13.2	943	13.0	4	1
12.53	1460	771	689	332	224	229	372	***	***	***	***	430	13.4	960	13.3	4	2
12.78	1482	783	699	336	228	231	386	***	***	***	***	449	13.6	978	13.8	4	3
13.07	1518	809	709	349	233	235	399	***	***	***	***	508	14.2	999	15.0	5	3
13.28	1535	809	726	353	235	236	429	***	***	61	50	521	14.3	999	15.0	5	4
13.52	1552	823	729	361	238	237	426	***	***	62	48	588	14.9	999	15.0	5	4
13.75	1567	830	737	364	240	239	440	***	***	59	44	598	15.0	999	15.0	5	4
14.06	1581	843	738	372	243	242	447	***	***	61	44	611	15.1	999	15.0	5	4
14.54	1602	861	741	382	247	242	478	230	486	73	52	624	15.2	999	15.0	5	5
15.05	1618	875	743	388	252	243	499	239	482	64	51	878	16.7	999	15.0	5	5
15.53	1624	881	743	391	252	246	529	242	503	75	56	973	17.4	999	15.0	5	5
16.05	1632	887	745	398	255	247	527	249	502	75	47	999	18.1	999	15.0	5	5
17.07	1638	895	743	402	257	250	561	253	500	85	58	999	18.1	999	15.0	5	5
18.07	1645	896	749	403	256	252	595	274	537	98	61	999	18.1	999	15.0	5	5
19.08	1645	895	750	407	258	250	556	260	518	77	42	***	****	***	****	5	5
20.08	1650	899	751	412	261	250	585	268	529	95	46	***	****	***	****	5	5
25.06	1649	901	748	420	271	253	717	294	596	170	93	***	****	***	****	5	5

NO.15 NORMAL MALE SOMATOTYPE:1.5,1.5,7.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
8.52	1415	722	693	268	215	***	293	***	***	***	***	298	9.8	675	9.5	1	1
9.01	1450	742	708	277	217	***	302	***	***	***	***	323	10.7	722	10.0	1	1
9.55	1487	751	736	290	223	239	318	***	***	***	***	372	12.2	833	11.3	1	1
9.99	1520	762	758	296	225	238	331	***	***	***	***	376	12.3	833	11.3	1	1
10.51	1544	773	771	297	228	244	343	***	***	***	***	384	12.5	906	12.4	1	1
10.99	1570	785	785	298	235	247	361	***	***	***	***	394	12.8	928	12.7	1	1
11.26	1593	791	802	307	237	249	372	***	***	49	60	394	12.8	943	13.0	1	1
11.54	1600	796	804	310	239	253	383	***	***	53	71	394	12.8	943	13.0	1	1
11.74	1612	800	812	310	238	254	383	***	***	48	64	405	12.9	962	13.4	1	1
11.99	1629	806	823	312	240	260	404	***	***	58	63	423	13.2	962	13.4	1	1
12.25	1644	812	832	313	242	263	401	***	***	50	56	435	13.4	978	13.8	1	1
12.54	1650	813	837	314	247	265	426	***	***	61	69	494	14.1	999	15.0	1	1
12.73	1664	817	847	318	247	262	429	203	425	56	66	502	14.1	999	15.0	2	1
13.00	1668	819	849	315	247	269	429	202	431	52	63	502	14.1	999	15.0	2	1
13.25	1698	831	867	327	250	270	461	215	439	60	71	502	14.1	999	15.0	2	1
13.54	1706	835	871	324	252	275	461	208	444	62	58	589	14.9	999	15.0	3	1
13.75	1718	844	874	332	252	274	465	208	444	54	65	598	15.0	999	15.0	3	1
14.00	1738	847	891	330	254	278	474	214	448	55	60	598	15.0	999	15.0	3	1
14.24	1743	853	890	328	256	280	477	210	435	54	62	598	15.0	999	15.0	4	2
14.53	1760	857	903	338	261	284	529	225	465	63	67	598	15.0	999	15.0	4	3
14.74	1788	870	918	348	263	285	543	223	464	59	61	598	15.0	999	15.0	4	3
14.97	1812	889	923	350	267	285	549	231	461	58	60	598	15.0	999	15.0	5	4
15.53	1865	911	954	362	274	290	580	230	465	57	49	598	15.0	999	15.0	5	4
15.99	1889	929	960	367	280	291	595	233	456	65	47	622	15.2	999	15.0	5	5
16.98	1924	947	977	385	287	293	628	242	473	64	44	913	17.0	999	15.0	5	5

NO.16 NORMAL MALE SOMATOTYPE:2.0,2.0,6.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
5.01	1112	635	477	246	186	177	188	***	***	***	***	150	4.5	388	6.3	1	1
5.53	1142	654	488	248	189	184	195	***	***	***	***	158	4.8	433	6.9	1	1
6.01	1174	657	517	255	193	187	202	***	***	***	***	196	6.2	473	7.3	1	1
6.61	1214	673	541	261	197	191	209	***	***	43	55	226	7.3	527	7.9	1	1
7.01	1230	683	547	264	199	197	218	***	***	38	53	233	7.5	556	8.2	1	1
7.56	1269	696	573	271	205	203	227	***	***	41	50	241	7.8	572	8.4	1	1
8.02	1294	708	586	275	209	209	236	156	330	38	52	241	7.8	641	9.1	1	1
8.56	1328	715	613	279	211	214	254	165	348	47	58	248	8.0	672	9.5	1	1
9.02	1358	734	624	286	216	220	268	166	365	44	50	261	8.5	718	9.9	1	1
9.55	1376	744	632	291	219	225	279	164	370	49	60	274	9.1	718	9.9	1	1
10.00	1407	753	654	297	221	229	284	169	367	45	56	287	9.5	804	10.9	1	1
10.55	1431	759	672	301	225	233	312	177	385	58	76	287	9.5	804	10.9	1	1
11.01	1460	768	692	305	227	239	314	175	381	46	63	292	9.6	854	11.6	1	1
11.55	1480	782	698	307	230	239	330	178	384	55	65	292	9.6	854	11.6	2	1
11.78	1503	786	717	309	232	243	337	180	398	49	68	***	****	***	****	2	1
12.01	1512	790	722	311	235	248	333	178	392	46	57	337	11.1	***	****	2	1
12.27	1530	795	735	316	239	249	349	180	400	53	66	365	12.1	887	12.1	2	1
12.54	1540	798	742	318	241	251	355	183	403	52	75	370	12.2	887	12.1	2	1
12.75	1548	799	749	322	242	251	357	183	410	51	64	370	12.2	922	12.6	2	1
13.02	1566	806	760	325	243	253	364	184	409	49	63	376	12.3	922	12.6	2	1
13.27	1585	815	770	327	247	257	370	185	404	48	59	376	12.3	978	13.8	3	1
13.54	1602	826	776	335	250	260	397	188	417	52	55	425	13.3	978	13.8	3	2
13.77	1627	835	792	339	255	265	414	199	431	60	69	425	13.3	978	13.8	3	2
14.02	1656	852	804	341	258	270	432	201	432	54	60	443	13.5	978	13.8	4	3
14.27	1682	871	811	342	263	272	461	205	451	62	58	525	14.3	978	13.8	4	4
14.56	1709	881	828	357	266	272	486	212	451	64	60	557	14.6	978	13.8	5	5
14.77	1727	891	836	363	270	275	498	212	456	63	54	566	14.7	991	14.2	5	5
15.06	1749	908	841	368	272	277	500	212	456	57	47	589	14.9	999	15.0	5	5
15.56	1775	921	854	375	276	277	522	217	464	62	52	598	15.0	999	15.0	5	5
16.01	1791	930	861	383	280	280	534	220	457	60	51	714	15.8	999	15.0	5	5
17.01	1810	947	863	395	287	279	558	226	469	65	54	***	****	***	****	5	5
18.06	1821	957	864	396	287	279	564	222	459	60	46	999	18.1	999	15.0	5	5
19.02	1823	956	867	402	290	279	590	233	483	75	51	***	****	***	****	5	5
20.23	1823	956	867	403	289	280	579	233	475	75	53	***	****	***	****	5	5

NO.17 NORMAL MALE SOMATOTYPE:2.0,3.0,6.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
4.96	1092	617	475	227	163	166	159	***	***	35	56	225	7.3	456	7.1	1	1
5.59	1119	640	479	234	169	172	175	151	327	36	59	240	7.8	481	7.4	1	1
5.98	1142	648	494	238	171	174	175	152	324	33	55	240	7.8	490	7.5	1	1
6.52	1172	660	512	242	175	179	186	154	330	34	51	248	8.1	509	7.7	1	1
6.98	1199	671	528	247	179	184	186	155	320	31	48	252	8.2	580	8.5	1	1
7.59	1240	687	553	253	181	190	200	157	329	34	50	277	9.2	642	9.1	1	1
7.97	1265	692	573	258	185	193	204	158	332	33	47	280	9.3	661	9.3	1	1
8.51	1293	706	587	263	187	199	224	166	351	35	50	293	9.7	692	9.7	1	1
8.97	1324	716	608	269	189	204	233	172	352	36	47	328	10.8	711	9.9	1	1
9.50	1356	734	622	275	195	209	250	173	364	39	52	334	11.0	762	10.4	1	1
9.96	1380	742	638	277	199	214	261	173	370	35	45	345	11.4	871	11.8	1	1
10.50	1407	752	655	286	200	216	278	178	374	37	49	354	11.7	893	12.2	1	1
10.98	1433	756	677	292	206	221	284	182	383	41	42	370	12.2	931	12.8	1	1
11.52	1455	767	688	296	209	224	299	186	396	39	44	370	12.2	943	13.0	2	1
11.98	1478	774	704	298	209	231	310	189	396	42	46	384	12.5	960	13.3	2	1
12.24	1484	780	704	303	212	232	325	193	400	40	49	397	12.8	978	13.8	2	1
12.51	1504	790	714	307	215	235	338	198	412	43	51	408	13.0	978	13.8	3	2
12.76	1517	795	722	311	217	237	347	197	410	42	47	418	13.2	991	14.2	3	2
12.97	1534	803	731	314	219	238	350	200	413	43	45	427	13.3	991	14.2	3	3
13.34	1564	823	741	319	223	243	375	205	427	44	51	535	14.4	991	14.2	4	4
13.51	1576	823	753	325	224	244	388	207	427	44	48	555	14.6	999	15.0	4	4
13.76	1594	827	767	331	227	246	407	215	430	47	46	567	14.7	999	15.0	4	4
14.96	1668	864	804	353	246	254	468	233	456	49	45	598	15.0	999	15.0	4	4
16.17	1697	885	812	368	255	253	499	240	465	53	45	782	16.2	999	15.0	5	5
16.96	1719	900	819	373	259	256	497	239	454	50	42	951	17.2	999	15.0	5	5
18.13	1727	913	814	378	265	256	525	252	470	57	42	***	****	***	****	5	5

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
NO.18 NORMAL MALE SOMATOTYPE:2.5,3.0,5.0																	
3.50	925	549	376	203	160	141	147	***	***	***	***	77	2.6	181	1.4	1	1
4.02	973	565	408	216	163	146	152	***	***	***	***	111	3.3	202	3.0	1	1
4.50	1009	595	414	219	166	151	159	***	***	***	***	119	3.6	206	3.2	1	1
5.10	1042	600	442	233	172	152	166	***	***	42	70	140	4.2	206	3.2	1	1
5.50	1074	613	461	231	173	155	168	***	***	36	77	144	4.3	226	4.0	1	1
6.05	1102	628	474	237	176	163	177	***	***	48	81	175	5.4	226	4.0	1	1
6.51	1127	639	488	243	182	167	181	160	307	38	65	194	6.1	247	4.4	1	1
7.05	1156	647	509	249	184	173	195	164	318	41	88	200	6.3	247	4.4	1	1
7.51	1186	665	521	254	187	175	204	165	325	42	70	205	6.5	261	4.6	1	1
8.04	1212	680	532	260	191	180	216	168	333	42	70	205	6.5	261	4.6	1	1
8.49	1239	682	557	265	195	183	218	162	327	40	66	205	6.5	290	5.1	1	1
9.04	1264	697	567	266	197	188	227	166	337	40	71	212	6.8	394	6.4	1	1
9.50	1291	704	587	271	199	191	237	172	342	40	67	218	7.0	419	6.8	1	1
10.04	1315	716	599	275	204	195	254	178	361	45	79	222	7.2	501	7.6	1	1
10.50	1337	727	610	281	208	199	261	180	364	46	80	231	7.5	578	8.5	1	1
11.03	1369	740	629	292	214	205	279	185	367	43	79	262	8.6	638	9.1	2	1
11.51	1390	741	649	296	217	206	285	185	374	42	71	298	9.8	673	9.5	2	1
12.03	1410	749	661	301	219	210	299	185	385	49	73	330	10.9	717	9.9	2	1
12.26	1424	754	670	303	220	212	303	188	384	52	70	332	11.0	758	10.4	2	1
12.51	1431	761	670	306	221	214	318	194	392	56	74	352	11.6	770	10.5	2	1
12.76	1450	771	679	309	224	217	326	194	400	54	78	352	11.6	851	11.6	3	1
13.05	1469	780	689	314	226	218	342	198	414	58	78	370	12.2	868	11.8	3	1
13.26	1482	787	695	314	228	222	355	201	422	62	84	383	12.5	868	11.8	3	1
13.55	1499	791	708	318	230	225	358	202	414	47	73	389	12.7	900	12.3	3	1
14.05	1533	800	733	327	235	233	384	206	423	54	75	406	13.0	943	13.0	4	2
14.23	1557	807	750	333	238	233	412	212	440	56	80	426	13.3	953	13.2	4	2
14.50	1581	826	755	339	241	240	424	217	440	56	69	509	14.2	969	13.5	4	3
14.77	1609	838	771	345	244	244	442	220	439	57	67	517	14.2	999	15.0	5	4
15.04	1630	848	782	356	246	245	470	230	459	58	69	589	14.9	999	15.0	5	4
15.50	1658	863	795	363	254	248	476	224	454	58	59	598	15.0	999	15.0	5	4
16.04	1681	882	799	373	256	248	529	243	482	68	72	651	15.4	999	15.0	5	5
17.03	1697	889	808	375	259	250	525	246	470	65	67	783	16.2	999	15.0	5	5
18.05	1705	895	810	383	259	250	526	244	464	60	58	999	18.1	999	15.0	5	5
19.10	1711	902	809	387	261	248	555	251	470	66	58	***	****	***	****	5	5
20.04	1711	905	806	389	262	249	592	259	503	94	80	***	****	***	****	5	5
NO.19 NORMAL MALE SOMATOTYPE:2.0,4.0,5.0																	
6.02	1207	660	547	259	177	193	216	170	344	45	61	241	7.8	479	7.3	1	1
6.52	1238	664	574	267	183	197	230	173	348	44	58	251	8.2	503	7.6	1	1
7.04	1263	674	589	272	183	202	233	173	352	49	53	259	8.5	544	8.1	1	1
7.54	1294	681	613	278	189	208	244	174	356	49	55	259	8.5	605	8.8	1	1
8.02	1318	688	630	281	193	212	260	179	367	52	60	266	8.8	644	9.2	1	1
8.54	1348	707	641	287	198	214	276	183	379	50	62	273	9.0	662	9.4	1	1
9.02	1371	710	661	291	199	221	282	187	380	48	52	277	9.2	688	9.6	1	1
9.53	1399	724	675	298	201	226	290	183	382	46	47	286	9.5	719	10.0	1	1
10.03	1420	726	694	305	206	230	307	191	390	48	54	325	10.7	748	10.2	1	1
10.53	1443	728	715	309	208	233	327	199	411	51	60	325	10.7	778	10.6	1	1
11.03	1472	750	722	316	214	235	335	195	409	50	55	349	11.6	778	10.6	1	1
11.32	1483	751	732	316	215	240	345	208	420	56	58	361	11.9	778	10.6	1	1
11.55	1491	754	737	317	217	241	355	206	414	56	58	376	12.3	778	10.6	1	1
11.78	1510	761	749	321	217	242	360	206	428	52	55	376	12.3	813	11.0	1	1
12.01	1516	758	758	323	220	245	361	201	427	49	51	376	12.3	845	11.5	2	1
12.31	1535	768	767	324	221	246	375	208	435	56	57	376	12.3	867	11.8	2	1
12.52	1541	772	769	326	222	249	378	212	430	55	54	376	12.3	867	11.8	2	1
12.77	1555	774	781	329	222	250	389	209	443	55	58	384	12.5	922	12.6	3	2
13.04	1569	778	791	332	225	251	394	209	435	54	53	394	12.8	943	13.0	3	2
13.31	1582	793	789	334	226	253	410	217	448	63	63	394	12.8	943	13.0	3	3
13.52	1592	790	802	336	228	254	409	211	440	54	56	407	13.0	943	13.0	3	3
13.79	1605	797	808	342	230	258	431	221	454	58	64	***	****	***	****	4	3
14.02	1625	803	822	344	234	260	445	224	450	55	57	***	****	***	****	5	4
14.32	1647	807	840	350	236	263	472	234	477	65	65	***	****	***	****	5	4
14.53	1671	822	849	355	242	264	485	230	472	55	54	***	****	***	****	5	4
14.78	1685	836	849	359	242	267	511	237	484	70	59	***	****	***	****	5	5
15.05	1707	844	863	365	243	271	524	242	488	62	53	***	****	***	****	5	5
15.95	1762	879	883	381	253	272	570	252	500	75	67	***	****	***	****	5	5
17.01	1789	891	898	394	258	274	605	259	510	77	57	***	****	***	****	5	5
18.06	1801	904	897	403	260	272	626	268	519	88	60	***	****	***	****	5	5
19.04	1802	904	898	405	262	275	642	277	516	89	71	***	****	***	****	5	5
NO.20 NORMAL MALE SOMATOTYPE:3.0,3.5,5.0																	
3.06	1027	609	418	235	169	160	170	***	***	53	86	141	4.2	274	4.8	1	1
3.49	1067	634	433	243	174	168	179	***	***	53	81	***	****	***	****	1	1
4.00	1114	653	461	257	179	172	188	***	***	46	73	161	4.9	299	5.2	1	1
4.50	1154	673	481	264	186	175	204	166	321	50	69	205	6.5	345	5.8	1	1
5.00	1186	681	505	268	188	182	211	167	332	47	64	209	6.7	419	6.8	1	1
5.48	1225	703	522	277	194	190	227	164	335	41	55	245	8.0	474	7.3	1	1
6.01	1258	716	542	284	199	195	232	167	336	44	62	254	8.3	524	7.9	1	1
6.49	1285	729	556	293	205	202	253	174	352	50	67	270	8.9	570	8.4	1	1
6.99	1327	736	591	298	207	207	268	177	359	50	61	283	9.4	641	9.1	1	1
7.49	1360	756	604	303	211	213	281	178	363	44	73	283	9.4	701	9.8	1	1
7.99	1385	762	623	308	215	219	287	171	360	43	49	316	10.4	***	****	1	1
8.49	1415	775	640	317	222	222	312	183	381	47	68	343	11.3	784	10.7	1	1
9.00	1448	788	660	322	225	227	319	182	383	42	57	371	12.2	850	11.5	1	1
9.50	1474	802	672	328	230	230	347	192	399	49	78	376	12.3	872	11.9	1	1
9.98	1498	810	688	333	233	236	356	192	407	48	66	386	12.6	915	12.5	1	1
10.50	1521	815	706	338	237	239	375	194	414	44	73	386	12.6	931	12.8	1	1
10.98	1543	825	718	343	239	241	378	193	406	46	59	394	12.8	943	13.0	2	1
11.30	1555	836	719	347	243	243	400	204	430	49	72	405	12.9	962	13.4	2	1
11.50	1568	842	726	347	244	245	394	199	423	51	68	435	13.4	962	13.4	2	1
11.74	1581	842	739	352	247	246	413	201	426	46	63	447	13.6	962	13.4	2	1
11.99	1589	853	736	353	248	249	420	206	430	45	66	458	13.7	978	13.8	2	2
12.34	1608	852	756	357	250	253	436	206	435	50	67	***	****	***	****	3	2
12.49	1615	856	759	358	252	254	446	209	439	47	80	477	13.9	978	13.8	3	3

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AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
NO.20 NORMAL MALE SOMATOTYPE:3.0,3.5,5.0																	
12.74	1634	863	771	362	255	257	459	212	444	53	73	549	14.6	991	14.2	3	3
12.99	1649	873	776	367	262	260	458	213	451	47	62	549	14.6	991	14.2	3	3
13.28	1670	875	795	371	264	262	479	223	445	54	74	549	14.6	999	15.0	4	4
13.51	1691	890	801	375	268	266	508	222	468	50	67	549	14.6	999	15.0	4	4
13.74	1718	899	819	381	272	267	517	224	456	49	63	549	14.6	999	15.0	4	4
13.97	1741	913	828	386	276	270	543	226	472	50	56	598	15.0	999	15.0	5	4
14.27	1764	921	843	391	283	273	558	229	469	55	55	598	15.0	999	15.0	5	5
14.49	1781	931	850	396	284	275	573	232	479	52	54	598	15.0	999	15.0	5	5
14.73	1803	950	853	400	288	276	610	239	498	58	54	598	15.0	999	15.0	5	5
15.00	1820	958	862	408	291	274	603	244	486	59	55	605	15.0	999	15.0	5	5
15.48	1845	980	865	412	298	277	640	249	495	64	57	666	15.5	999	15.0	5	5
15.98	1863	999	864	422	304	238	700	226	521	84	67	***	****	***	****	5	5
17.07	1880	999	867	427	307	276	696	263	520	91	66	***	****	***	****	5	5
18.13	1886	999	872	430	308	277	736	272	539	107	68	***	****	***	****	5	5
NO.21 NORMAL MALE SOMATOTYPE:2.0,4.0,4.5																	
4.53	1052	594	458	230	***	***	177	***	***	***	***	***	****	***	****	1	1
5.02	1087	617	470	248	***	***	190	***	***	***	***	***	****	***	****	1	1
5.53	1118	624	494	251	***	***	195	***	***	***	***	***	****	***	****	1	1
6.03	1156	650	506	251	***	***	202	***	***	***	***	206	6.6	459	7.1	1	1
6.54	1183	661	522	252	181	***	206	***	***	***	***	242	7.9	470	7.3	1	1
7.04	1214	667	547	261	185	***	227	***	***	***	***	253	8.2	470	7.3	1	1
7.53	1245	684	561	263	188	***	234	***	***	***	***	263	8.6	489	7.4	1	1
8.03	1270	694	576	271	190	206	243	***	***	***	***	263	8.6	524	7.9	1	1
8.53	1294	707	587	275	193	208	254	***	***	***	***	269	8.9	570	8.4	1	1
9.01	1322	720	602	284	195	213	261	***	***	***	***	282	9.3	632	9.0	1	1
9.53	1356	728	628	290	197	220	281	***	***	44	61	282	9.3	632	9.0	1	1
10.60	1403	746	657	294	205	228	308	***	***	43	66	287	9.5	786	10.7	1	1
11.02	1424	757	667	300	205	232	313	185	412	41	65	293	9.7	***	****	2	1
11.54	1446	768	678	305	210	235	331	188	425	45	61	325	10.7	834	11.3	2	1
12.02	1471	775	696	308	211	240	341	189	429	45	59	343	11.3	834	11.3	2	1
12.53	1493	783	710	312	214	246	361	195	441	48	67	343	11.3	862	11.7	2	1
12.79	1505	790	715	316	215	247	370	193	444	41	67	348	11.5	883	12.1	2	1
13.04	1515	796	719	319	216	250	379	195	449	49	64	356	11.8	883	12.1	2	1
13.24	1530	800	730	319	216	256	381	195	442	48	68	363	12.0	883	12.1	2	1
13.53	1558	812	746	327	219	256	406	209	459	54	64	363	12.0	922	12.6	2	2
13.78	1576	816	760	329	222	260	424	206	457	52	65	386	12.6	940	12.9	3	3
14.03	1602	827	775	333	225	263	440	213	465	50	60	445	13.6	962	13.4	3	4
14.24	1626	842	784	338	228	264	448	215	455	57	58	463	13.8	962	13.4	4	4
14.53	1655	854	801	343	230	267	471	219	467	56	56	475	13.9	987	14.1	4	4
14.78	1678	864	814	351	238	270	509	230	484	59	63	560	14.7	987	14.1	5	4
15.03	1696	871	825	356	239	273	535	235	504	60	60	569	14.7	999	15.0	5	4
15.53	1732	894	838	368	245	276	550	239	506	60	57	596	15.0	999	15.0	5	5
16.02	1753	907	846	376	248	277	590	246	516	62	60	701	15.7	***	****	5	5
16.52	1767	912	855	387	251	279	619	256	528	70	68	785	16.2	999	15.0	5	5
16.99	1775	920	855	389	253	279	618	257	531	70	68	918	17.0	999	15.0	5	5
17.94	1784	934	850	396	255	280	631	265	532	71	65	991	17.8	999	15.0	5	5
20.18	1795	939	856	407	258	281	647	273	516	76	55	999	18.1	999	15.0	5	5
21.03	1792	931	861	406	259	281	648	272	517	81	59	***	****	***	****	5	5
25.03	1795	942	853	407	257	279	637	271	516	80	48	***	****	***	****	5	5
NO.22 NORMAL MALE SOMATOTYPE:3.0,4.0,4.5																	
4.98	1067	592	475	242	178	165	175	***	***	***	***	150	4.5	384	6.3	1	1
5.48	1104	608	496	248	180	170	184	***	***	***	***	153	4.6	447	7.0	1	1
5.98	1140	620	520	256	185	178	193	***	***	47	58	196	6.2	472	7.3	1	1
6.46	1177	637	540	263	187	181	202	***	***	44	52	236	7.7	483	7.4	1	1
6.97	1208	650	558	269	197	184	218	***	***	55	61	245	8.0	544	8.1	1	1
7.49	1245	663	582	276	200	192	225	168	352	47	54	248	8.0	572	8.4	1	1
7.99	1281	677	604	282	205	197	243	170	353	49	60	268	8.8	572	8.4	1	1
8.49	1319	695	624	290	206	203	254	170	360	48	56	282	9.3	665	9.4	1	1
8.97	1345	704	641	296	213	205	266	178	371	48	57	319	10.5	743	10.2	1	1
9.50	1379	720	659	302	219	210	277	175	371	46	55	343	11.3	743	10.2	1	1
9.98	1404	737	667	309	224	216	291	180	377	47	60	351	11.6	816	11.1	1	1
10.48	1433	742	691	312	226	221	313	178	388	50	55	358	11.8	832	11.3	1	1
10.98	1460	757	703	317	230	226	329	185	400	54	64	358	11.8	900	12.3	2	1
11.47	1500	772	728	328	235	231	357	193	408	48	56	371	12.2	900	12.3	3	1
11.97	1548	795	753	339	245	238	392	200	422	55	60	394	12.8	922	12.6	3	2
12.22	1570	809	761	348	249	241	413	205	425	54	59	394	12.8	960	13.3	3	3
12.49	1605	825	780	354	254	248	427	208	434	55	53	477	13.9	978	13.8	4	4
12.78	1639	841	798	364	257	250	462	215	442	55	54	549	14.6	999	15.0	4	4
12.99	1660	855	805	366	260	254	474	216	454	55	51	549	14.6	999	15.0	5	4
13.24	1675	865	810	373	263	255	498	224	461	58	54	***	****	***	****	5	4
13.47	1690	875	815	376	265	255	503	223	455	54	55	575	14.8	999	15.0	5	4
13.81	1711	881	830	381	268	255	520	229	462	58	52	584	14.9	999	15.0	5	4
13.99	1718	890	828	384	269	256	530	232	468	59	55	618	15.1	999	15.0	5	4
14.24	1734	897	837	393	272	255	551	237	476	63	56	618	15.1	999	15.0	5	5
14.47	1744	904	840	393	274	257	554	238	480	63	54	618	15.1	999	15.0	5	5
14.79	1753	910	843	397	275	257	564	241	480	56	51	665	15.5	999	15.0	5	5
14.98	1762	918	844	402	277	259	590	244	493	63	55	678	15.6	999	15.0	5	5
15.48	1773	927	846	406	279	260	601	246	497	65	54	710	15.8	999	15.0	5	5
15.98	1778	936	842	409	280	259	600	250	488	67	56	817	16.4	999	15.0	5	5
16.48	1789	943	846	418	286	258	629	262	505	77	64	***	****	***	****	5	5
17.23	1791	948	843	418	283	260	626	266	510	76	66	999	18.1	999	15.0	5	5
18.97	1791	948	843	425	284	258	654	275	510	83	60	999	18.1	999	15.0	5	5
20.98	1786	944	842	425	284	256	660	269	513	88	57	***	****	***	****	5	5
NO.23 NORMAL MALE SOMATOTYPE:3.0,3.0,4.5																	
2.59	956	569	387	216	148	152	143	162	341	66	85	***	****	***	****	1	1
3.01	993	587	406	218	153	153	152	160	329	54	73	119	3.5	202	3.0	1	1
3.51	1040	600	440	229	162	159	159	165	324	48	73	126	3.8	206	3.2	1	1
3.99	1064	616	448	241	166	167	173	163	326	53	80	144	4.3	226	4.0	1	1

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AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
NO.23 NORMAL MALE SOMATOTYPE:3.0,3.0,4.5																	
4.53	1108	629	479	247	172	174	175	158	319	45	63	167	5.1	226	4.0	1	1
5.01	1133	641	492	252	177	179	190	164	333	50	70	217	7.0	241	4.3	1	1
5.51	1174	656	518	257	181	184	199	165	341	46	62	230	7.4	281	4.9	1	1
6.01	1195	666	529	262	186	191	207	167	347	52	62	236	7.7	347	5.9	1	1
6.50	1225	680	545	270	191	196	217	168	352	47	58	244	7.9	389	6.3	1	1
7.00	1260	692	568	277	196	201	228	168	363	46	55	260	8.5	451	7.1	1	1
7.52	1290	705	585	283	200	205	239	172	366	49	55	267	8.8	481	7.4	1	1
8.02	1314	713	601	287	205	210	254	172	366	47	58	277	9.2	544	8.1	1	1
8.50	1340	721	619	295	209	214	274	180	402	55	64	286	9.5	603	8.7	1	1
9.01	1372	734	638	300	214	219	280	174	393	46	57	294	9.7	702	9.8	1	1
9.49	1396	746	650	304	218	221	294	180	405	48	60	312	10.3	733	10.1	1	1
10.01	1421	756	665	308	222	227	304	179	403	45	59	323	10.7	803	10.9	1	1
10.51	1443	760	683	315	222	235	317	186	409	47	53	359	11.9	803	10.9	1	1
11.01	1464	775	689	316	226	232	325	180	402	45	54	371	12.2	892	12.2	1	1
11.26	1477	778	699	320	228	232	334	186	419	47	55	377	12.4	909	12.4	2	1
11.50	1490	780	710	323	234	232	342	190	424	47	57	384	12.5	909	12.4	2	1
11.79	1501	783	718	324	234	238	344	191	415	51	53	384	12.5	909	12.4	2	1
12.02	1509	785	724	327	234	239	356	192	423	48	57	384	12.5	943	13.0	3	1
12.25	1522	794	728	331	236	242	363	194	433	45	59	384	12.5	943	13.0	3	2
12.48	1530	797	733	331	236	241	370	195	438	49	62	384	12.5	943	13.0	3	2
12.79	1544	795	749	335	235	245	375	204	435	48	61	384	12.5	943	13.0	3	2
13.00	1555	804	751	336	242	246	386	203	435	50	61	394	12.8	960	13.3	3	2
13.25	1568	807	761	339	245	246	397	204	448	51	56	414	13.1	978	13.8	3	3
13.52	1591	823	768	344	246	249	421	209	465	55	65	414	13.1	978	13.8	4	3
13.79	1608	832	776	347	249	253	425	209	460	51	58	427	13.3	978	13.8	4	4
14.00	1627	843	784	351	252	255	456	215	477	55	60	440	13.5	978	13.8	5	4
14.26	1655	852	803	359	258	258	473	212	469	53	51	***	****	***	****	5	4
14.49	1666	866	800	364	262	260	498	226	486	56	61	***	****	***	****	5	4
14.80	1695	878	817	369	266	261	519	232	491	59	56	***	****	***	****	5	4
15.01	1712	894	818	375	270	261	532	231	491	63	53	***	****	***	****	5	4
15.53	1746	910	836	383	275	266	555	237	504	63	53	***	****	***	****	5	5
16.01	1768	926	842	391	280	266	582	250	507	71	57	***	****	***	****	5	5
17.01	1793	943	850	397	282	265	612	247	535	72	54	***	****	***	****	5	5
17.96	1802	950	852	404	283	265	627	255	524	75	56	***	****	***	****	5	5
19.13	1807	954	853	409	283	267	653	270	544	80	58	***	****	***	****	5	5
20.04	1808	946	862	406	283	265	633	254	503	88	54	***	****	***	****	5	5
NO.24 NORMAL MALE SOMATOTYPE:6.0,2.5,2.5																	
9.47	1329	738	591	286	221	200	304	203	420	60	91	286	9.5	605	8.8	1	1
9.97	1360	751	609	292	224	206	317	202	426	68	90	286	9.5	651	9.2	1	1
10.49	1387	758	629	298	228	210	340	213	447	74	93	286	9.5	722	10.0	1	1
10.97	1413	764	649	303	231	212	341	208	435	55	87	292	9.6	773	10.5	2	1
11.49	1438	776	662	308	236	217	355	211	448	65	88	351	11.6	819	11.1	2	1
11.70	1452	777	675	308	236	220	353	211	445	63	87	351	11.6	858	11.7	2	1
11.99	1468	788	680	312	237	221	354	201	423	53	78	370	12.2	858	11.7	2	1
12.24	1481	794	687	315	239	222	374	217	452	63	83	370	12.2	872	11.9	2	1
12.48	1499	803	696	319	242	223	410	224	480	74	100	376	12.3	885	12.1	3	1
12.70	1511	812	699	324	244	228	416	227	478	74	97	376	12.3	885	12.1	3	1
12.98	1535	820	715	329	247	234	440	236	489	80	103	376	12.3	906	12.4	3	1
13.23	1553	834	719	333	249	235	463	240	495	92	110	389	12.7	922	12.6	4	2
13.50	1580	842	738	341	256	236	480	250	502	92	110	417	13.2	922	12.6	4	3
13.69	1601	854	747	343	259	238	498	244	505	90	113	429	13.3	962	13.4	4	3
13.96	1624	866	758	346	265	241	516	250	517	85	120	508	14.2	978	13.8	5	4
14.23	1652	876	776	352	267	242	520	242	517	74	92	567	14.7	999	15.0	5	4
14.48	1678	884	794	354	273	244	528	242	508	73	90	589	14.9	999	15.0	5	4
14.69	1690	897	793	358	275	247	517	242	500	69	74	589	14.9	999	15.0	5	4
14.98	1703	900	803	364	278	248	536	241	505	72	73	598	15.0	999	15.0	5	5
15.47	1732	924	808	372	285	247	571	248	508	73	73	598	15.0	999	15.0	5	5
15.97	1758	932	826	375	287	250	596	256	526	83	77	648	15.3	999	15.0	5	5
16.99	1778	951	827	385	292	250	636	263	539	88	93	***	****	***	****	5	5
18.00	1784	970	814	394	300	252	744	303	591	175	142	***	****	***	****	5	5
19.06	1795	979	816	397	307	252	846	319	620	226	190	***	****	***	****	5	5
20.02	1795	978	817	405	304	252	881	330	630	255	184	***	****	***	****	5	5
NO.25 NORMAL MALE SOMATOTYPE:6.0,3.0,1.5																	
8.58	1354	744	610	293	214	220	339	217	449	90	107	304	10.0	774	10.5	1	1
9.07	1374	753	621	299	218	223	351	217	461	77	103	328	10.8	804	10.9	1	1
9.60	1401	765	636	303	225	231	374	228	473	87	130	338	11.2	838	11.4	1	1
10.06	1417	768	649	306	227	232	384	228	475	78	120	345	11.4	865	11.8	1	1
10.52	1442	772	670	307	228	236	377	217	457	62	100	355	11.7	887	12.1	1	1
11.05	1463	784	679	311	230	238	389	223	464	67	99	361	11.9	887	12.1	1	1
11.27	1466	782	684	312	233	238	379	216	453	65	87	368	12.1	900	12.3	1	1
11.52	1478	786	692	317	237	240	394	220	460	68	94	368	12.1	922	12.6	1	1
11.78	1488	790	698	317	235	245	409	228	483	77	113	380	12.4	922	12.6	1	1
12.05	1499	801	698	319	238	244	452	238	502	81	115	388	12.6	940	12.9	1	1
12.26	1505	801	704	320	239	245	465	240	514	95	138	399	12.8	962	13.4	1	1
12.49	1514	805	709	323	242	247	477	247	524	110	140	399	12.8	962	13.4	2	1
12.78	1530	809	721	327	245	253	501	254	530	130	164	412	13.1	962	13.4	2	1
13.05	1549	814	735	329	246	252	510	255	532	110	150	471	13.9	978	13.8	2	1
13.24	1551	816	735	331	248	255	517	254	526	101	145	505	14.1	987	14.1	3	1
13.53	1573	827	746	335	248	259	543	261	534	117	145	528	14.4	987	14.1	3	1
13.78	1588	834	754	340	253	261	563	263	544	116	152	589	14.9	999	15.0	4	2
14.07	1612	849	763	345	253	269	596	269	550	113	152	589	14.9	999	15.0	4	3
14.27	1636	864	772	349	261	267	612	270	562	107	152	***	****	***	****	4	3
14.52	1655	872	783	355	265	270	631	268	563	102	145	***	****	***	****	5	4
14.77	1678	880	798	358	269	272	632	270	563	113	132	***	****	***	****	5	4
15.06	1695	892	803	364	271	273	644	261	563	94	120	***	****	***	****	5	4
15.52	1718	900	818	367	273	271	653	265	562	100	115	***	****	***	****	5	5
16.06	1745	932	813	375	279	273	705	275	580	105	123	***	****	***	****	5	5
17.05	1763	954	809	387	287	272	835	312	633	154	185	***	****	***	****	5	5
18.07	1791	966	825	392	290	276	846	315	644	150	166	***	****	***	****	5	5
19.07	1793	980	813	394	294	276	904	322	654	202	175	***	****	***	****	5	5
20.26	1796	977	819	393	297	276	874	314	632	165	151	***	****	***	****	5	5

NO.26 NORMAL MALE SOMATOTYPE:5.0,3.5,2.5

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
7.50	1231	686	545	280	187	196	243	185	364	55	105	265	8.7	580	8.5	1	1
7.98	1258	701	557	288	193	198	252	186	386	54	98	265	8.7	580	8.5	1	1
8.50	1284	709	575	297	197	205	268	196	393	64	106	273	9.0	642	9.1	1	1
9.00	1311	721	590	299	199	210	280	199	406	61	103	282	9.3	661	9.3	1	1
9.50	1337	736	601	306	206	213	313	210	438	74	134	288	9.5	673	9.5	1	1
10.00	1365	748	617	311	208	220	325	210	430	67	127	293	9.7	704	9.8	2	1
10.52	1397	755	642	323	213	224	371	231	471	97	142	322	10.6	743	10.2	3	1
10.79	1410	765	645	326	219	229	385	231	478	86	145	369	12.2	790	10.7	3	1
10.97	1429	770	659	329	219	230	396	235	474	91	136	377	12.4	861	11.7	4	1
11.24	1455	779	676	331	222	238	390	234	467	75	131	384	12.5	878	12.0	4	2
11.51	1470	793	677	338	224	239	410	234	463	76	122	384	12.5	922	12.6	4	2
11.78	1507	802	705	346	231	242	437	232	474	79	115	407	13.0	978	13.8	4	3
11.99	1523	813	710	350	235	243	435	231	471	70	103	407	13.0	978	13.8	4	3
12.30	1548	821	727	357	238	247	445	229	470	61	87	508	14.2	978	13.8	5	4
12.51	1564	838	726	363	243	248	476	236	491	67	90	567	14.7	991	14.2	5	4
12.78	1591	845	746	367	242	250	494	240	487	68	91	577	14.8	999	15.0	5	4
12.99	1597	855	742	370	245	250	489	233	490	65	82	598	15.0	999	15.0	5	5
13.22	1613	860	753	373	245	251	512	245	497	73	95	598	15.0	999	15.0	5	5
13.50	1624	876	748	380	252	250	562	256	531	87	122	613	15.1	999	15.0	5	5
13.77	1634	888	746	385	251	253	583	264	544	92	138	660	15.4	999	15.0	5	5
13.97	1640	889	751	385	252	253	592	260	542	92	125	694	15.7	999	15.0	5	5
14.25	1643	893	750	394	253	251	686	295	597	162	228	751	16.0	999	15.0	5	5
14.50	1652	906	746	399	259	253	711	300	609	220	225	883	16.8	999	15.0	5	5
14.79	1662	912	750	401	257	253	697	301	597	174	196	916	17.0	999	15.0	5	5
15.00	1669	912	757	403	259	253	675	290	590	150	164	***	****	***	****	5	5
16.00	1683	917	766	405	256	250	641	270	564	115	102	***	****	***	****	5	5

NO.27 NORMAL MALE SOMATOTYPE:4.5,4.5,1.5

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
8.54	1267	708	559	299	213	202	270	190	400	70	84	263	8.6	546	8.1	1	1
9.04	1299	725	574	305	218	204	291	199	414	68	95	270	8.9	546	8.1	1	1
9.52	1329	739	590	308	221	209	303	203	426	74	98	276	9.1	609	8.8	1	1
10.03	1360	751	609	316	225	214	323	204	435	62	102	306	10.1	661	9.3	1	1
10.51	1377	761	616	320	228	218	328	206	437	63	90	319	10.5	701	9.7	1	1
11.03	1403	771	632	325	233	222	344	209	439	58	93	353	11.7	729	10.0	1	1
11.28	1415	773	642	327	233	223	351	205	444	60	93	358	11.8	848	11.5	1	1
11.53	1430	781	649	332	235	228	367	220	457	72	98	376	12.3	887	12.1	2	1
11.81	1440	782	658	335	236	230	375	222	465	82	105	376	12.3	900	12.2	2	1
12.02	1454	785	669	337	240	230	399	225	474	70	107	384	12.5	900	12.2	2	1
12.27	1469	796	673	340	240	234	397	224	474	73	115	384	12.5	922	12.6	2	1
12.52	1481	798	683	343	245	236	408	222	478	84	105	384	12.5	922	12.6	2	1
12.81	1495	807	688	347	245	240	420	227	483	74	107	384	12.5	956	13.2	3	1
13.04	1509	808	701	350	247	240	428	225	480	70	107	384	12.5	956	13.2	3	1
13.27	1526	812	714	355	249	241	438	227	484	72	101	384	12.5	978	13.7	3	1
13.50	1542	822	720	357	250	244	457	228	492	83	102	423	13.3	978	13.7	3	1
13.81	1564	834	730	363	254	248	456	229	492	71	94	441	13.5	978	13.7	4	2
14.02	1578	842	736	369	256	250	493	236	507	73	95	451	13.6	987	14.0	4	3
14.27	1600	849	751	374	260	252	514	240	513	73	100	524	14.3	999	15.0	4	4
14.54	1627	860	767	381	264	255	543	248	521	74	93	672	15.5	999	15.0	5	4
14.81	1646	876	770	384	269	255	556	253	522	86	88	672	15.5	999	15.0	5	4
15.02	1657	882	775	387	272	256	554	242	510	78	73	672	15.5	999	15.0	5	4
15.51	1683	898	785	399	278	257	575	251	522	74	85	***	****	***	****	5	5
17.03	1712	931	781	412	288	257	715	288	581	127	127	***	****	***	****	5	5
18.02	1723	932	791	412	292	256	731	292	595	155	125	***	****	***	****	5	5
18.98	1724	934	790	420	296	259	734	299	598	190	132	***	****	***	****	5	5
18.98	1724	934	790	420	296	259	734	299	598	190	132	***	****	***	****	5	5
19.98	1725	946	779	427	294	259	801	308	624	244	164	***	****	***	****	5	5

NO.28 NORMAL MALE SOMATOTYPE:4.0,3.0,4.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
2.50	892	544	348	213	151	132	120	157	280	44	73	38	1.8	181	1.4	1	1
3.04	934	569	365	225	159	136	141	165	298	51	75	47	2.0	186	1.9	1	1
3.48	972	578	394	227	163	141	145	158	297	46	71	69	2.4	186	1.9	1	1
4.03	995	592	403	235	166	143	159	170	312	46	84	101	3.1	192	2.5	1	1
4.49	1025	609	416	239	171	149	166	170	305	50	83	115	3.4	202	3.0	1	1
5.03	1062	621	441	249	177	152	178	177	321	55	89	131	3.9	206	3.2	1	1
5.49	1087	628	459	254	181	160	182	173	315	45	87	131	3.9	206	3.2	1	1
6.02	1122	639	483	263	187	161	198	178	329	51	87	148	4.5	226	4.0	1	1
6.50	1148	653	495	266	190	167	205	176	337	53	88	151	4.6	261	4.6	1	1
7.02	1172	661	511	273	194	172	216	185	343	53	86	184	5.7	269	4.7	1	1
8.54	1258	697	561	288	205	186	244	188	357	45	64	227	7.3	409	6.7	1	1
9.04	1278	706	572	293	210	190	262	193	366	51	75	227	7.3	437	6.9	1	1
9.55	1309	713	596	294	213	194	275	193	376	52	74	263	8.6	477	7.3	1	1
10.03	1333	720	613	304	217	198	291	198	377	51	78	275	9.1	537	8.0	1	1
10.49	1351	729	622	311	222	200	299	202	389	52	74	275	9.1	609	8.8	1	1
11.03	1375	736	639	312	223	204	320	208	404	52	70	282	9.3	642	9.1	1	1
11.24	1381	732	649	317	225	206	322	205	402	56	81	290	9.6	668	9.4	1	1
11.47	1403	740	663	317	225	207	321	206	397	53	77	313	10.3	686	9.6	1	1
11.76	1413	746	667	321	227	210	337	213	404	61	91	313	10.3	737	10.1	2	1
12.03	1423	753	670	321	227	212	345	210	410	56	81	354	11.7	816	11.1	3	1
12.22	1431	758	673	324	229	214	346	206	418	59	78	354	11.7	833	11.3	3	1
12.50	1445	762	683	325	231	215	356	210	420	63	76	359	11.9	854	11.6	3	1
12.75	1456	763	693	329	233	217	358	214	413	65	81	371	12.2	876	11.9	3	2
13.04	1469	771	698	331	234	218	355	205	406	52	74	371	12.2	876	11.9	3	2
13.25	1482	774	708	332	235	220	366	207	410	59	73	***	****	***	****	3	2
13.50	1492	775	717	334	237	223	372	214	419	64	80	***	****	***	****	3	2
13.75	1507	780	727	336	239	223	388	219	423	63	80	***	****	***	****	3	3
14.04	1523	791	732	343	242	227	401	221	432	67	79	***	****	***	****	3	3
14.25	1538	797	741	344	244	230	409	217	436	63	72	***	****	***	****	3	3
14.50	1560	805	755	349	244	231	419	220	434	60	70	***	****	***	****	4	3
14.75	1585	820	765	361	250	235	448	230	443	66	65	***	****	***	****	4	4
15.03	1607	831	776	366	254	238	469	231	450	66	64	***	****	***	****	5	4
16.03	1685	875	810	385	266	246	556	246	478	75	62	***	****	***	****	5	5
17.05	1707	892	815	399	272	245	583	255	492	82	71	***	****	***	****	5	5
18.09	1719	899	820	406	274	243	588	258	485	86	70	***	****	***	****	5	5
19.28	1723	905	818	412	276	244	641	278	532	105	92	***	****	***	****	5	5

NO.29 NORMAL MALE SOMATOTYPE:4.0,2.0,4.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
5.01	1080	631	449	231	179	168	173	158	303	57	82	***	****	***	****	1	1
5.53	1098	642	456	236	182	171	173	158	305	52	74	171	5.3	253	4.5	1	1
6.02	1134	651	483	244	187	174	186	159	315	57	79	178	5.5	296	5.2	1	1
6.50	1156	655	501	250	189	176	190	158	314	50	79	184	5.7	339	5.8	1	1
7.02	1184	669	515	250	191	183	196	159	320	46	72	196	6.2	357	6.0	1	1
7.50	1211	682	529	260	197	186	205	161	327	42	63	233	7.6	372	6.2	1	1
8.02	1241	696	545	268	201	190	223	172	332	51	73	233	7.6	443	7.0	1	1
8.52	1264	698	566	271	205	198	227	167	338	43	71	251	8.2	460	7.2	1	1
9.01	1290	716	574	273	208	198	244	174	355	50	69	263	8.6	563	8.3	1	1
9.51	1314	724	590	277	216	200	246	175	358	46	63	276	9.1	579	8.5	1	1
10.03	1335	732	603	283	216	209	258	177	365	48	73	282	9.3	628	9.0	1	1
10.49	1356	737	619	286	219	210	271	175	374	48	73	286	9.5	646	9.2	1	1
11.01	1379	749	630	291	222	213	293	185	395	55	81	292	9.6	665	9.4	1	1
11.26	1391	753	638	294	224	216	295	182	393	51	76	310	10.2	677	9.5	1	1
11.53	1405	758	647	296	226	218	298	184	397	51	77	310	10.2	758	10.4	1	1
11.79	1414	762	652	297	226	220	308	190	400	52	80	315	10.4	801	10.9	1	1
12.01	1420	764	656	297	226	223	304	188	399	51	80	323	10.7	814	11.1	1	1
12.27	1431	774	657	299	228	220	315	189	407	54	82	***	****	***	****	1	1
12.50	1440	777	663	300	229	226	316	188	403	53	75	***	****	***	****	2	1
12.81	1456	778	678	303	232	230	331	196	420	63	90	***	****	***	****	2	1
13.02	1463	780	683	303	232	230	336	194	413	55	85	***	****	***	****	2	1
13.27	1472	788	684	303	234	232	353	201	430	68	92	***	****	***	****	3	1
13.54	1490	791	699	310	235	233	359	200	428	71	90	***	****	***	****	3	1
13.81	1499	795	704	312	236	235	372	208	431	68	103	***	****	***	****	3	1
14.02	1510	796	714	313	239	239	377	207	441	69	93	***	****	***	****	3	1
14.27	1524	803	721	312	241	240	386	207	450	64	91	***	****	***	****	3	2
14.59	1548	811	737	322	243	245	397	209	439	65	85	***	****	***	****	4	3
14.82	1574	825	749	326	247	***	413	215	448	67	95	***	****	***	****	4	3
15.01	1589	831	758	329	252	247	425	215	450	65	83	***	****	***	****	5	4
15.49	1634	858	776	338	261	256	472	223	475	67	91	***	****	***	****	5	5
15.97	1678	881	797	344	267	255	512	233	493	78	97	***	****	***	****	5	5
16.98	1724	917	807	363	281	257	591	256	529	94	130	***	****	***	****	5	5
18.05	1746	929	817	369	285	256	605	260	525	94	102	***	****	***	****	5	5

NO.30 NORMAL MALE SOMATOTYPE:3.0,4.0,4.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
7.57	1260	686	574	265	***	***	231	***	***	***	***	253	8.2	521	7.8	1	1
8.05	1294	700	594	274	201	***	263	***	***	***	***	262	8.6	623	9.0	1	1
8.64	1322	716	606	283	204	***	270	***	***	***	***	276	9.1	697	9.7	1	1
9.05	1345	722	623	288	205	***	277	***	***	***	***	283	9.4	745	10.2	1	1
9.59	1378	737	641	290	213	224	299	***	***	***	***	311	10.2	793	10.8	1	1
10.03	1401	743	658	294	216	220	306	***	***	***	***	348	11.5	832	11.3	1	1
10.63	1427	760	667	299	220	226	331	***	***	***	***	353	11.7	887	12.1	1	1
11.03	1447	768	679	305	223	230	331	***	***	***	***	353	11.7	906	12.4	1	1
11.59	1473	778	695	310	228	236	352	***	***	51	68	368	12.1	906	12.4	1	1
12.03	1495	780	715	312	230	236	367	***	***	51	70	380	12.4	941	12.9	1	1
12.58	1528	792	736	319	237	245	388	***	***	55	74	450	13.6	962	13.4	2	1
13.04	1550	807	743	322	240	249	408	207	430	58	77	482	14.0	978	13.8	2	1
13.29	1565	816	749	328	243	250	429	209	435	59	73	508	14.2	978	13.8	3	1
13.58	1588	831	757	335	245	252	449	216	455	65	79	519	14.2	978	13.8	3	1
13.79	1609	835	774	338	249	255	449	214	446	55	70	519	14.2	987	14.1	3	2
14.10	1640	857	783	348	255	258	493	226	460	61	69	528	14.4	987	14.1	4	3
14.38	1664	870	794	357	259	264	522	228	475	65	70	589	14.9	999	15.0	4	4
14.58	1681	887	794	360	262	270	533	228	470	66	69	681	15.6	999	15.0	4	4
14.79	1694	893	801	368	264	268	554	233	478	63	64	681	15.6	999	15.0	5	4
15.02	1717	906	811	372	265	270	558	239	486	64	62	701	15.7	999	15.0	5	5
15.31	1725	910	815	380	271	272	606	246	505	71	64	798	16.3	999	15.0	5	5
15.57	1740	918	822	382	270	272	604	250	499	76	67	811	16.3	999	15.0	5	5
16.03	1754	931	823	388	271	271	619	252	505	72	56	940	17.1	999	15.0	5	5
17.03	1770	948	822	406	277	278	672	266	532	93	67	999	18.1	999	15.0	5	5
18.04	1782	954	828	412	280	278	658	259	516	90	63	999	18.1	999	15.0	5	5

NO.31 NORMAL MALE SOMATOTYPE:4.0,4.0,3.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
3.98	1012	585	427	228	***	***	161	***	***	***	***	***	****	***	****	1	*
4.48	1043	603	460	241	***	***	168	***	***	***	***	159	4.8	316	5.5	1	*
4.98	1074	620	454	250	***	***	188	***	***	***	***	197	6.2	352	5.9	1	*
5.50	1110	630	480	255	185	***	188	***	***	***	***	206	6.6	390	6.3	1	*
5.99	1137	630	507	260	189	***	200	***	***	***	***	206	6.6	433	6.9	1	*
6.49	1167	645	522	261	193	***	209	***	***	***	***	216	6.9	486	7.4	1	*
6.99	1193	649	544	263	197	184	209	***	***	***	***	243	7.9	496	7.5	1	*
7.49	1225	658	567	270	200	189	222	***	***	***	***	258	8.4	543	8.1	1	*
7.97	1246	669	577	275	205	194	231	***	***	***	***	258	8.4	590	8.6	1	*
8.48	1272	681	591	282	208	198	245	***	***	49	60	269	8.9	619	8.9	1	*
8.98	1300	692	608	287	211	204	250	***	***	46	59	282	9.3	661	9.3	1	*
9.48	1321	699	622	291	213	207	268	***	***	45	62	282	9.3	755	10.3	1	*
9.98	1348	713	635	297	217	211	286	188	388	57	65	297	9.8	798	10.8	1	*
10.50	1372	721	651	304	224	217	304	194	401	48	62	330	10.9	798	10.8	1	*
11.07	1402	731	671	305	227	218	316	200	407	61	71	330	10.9	848	11.5	1	*
11.49	1419	740	679	305	231	220	327	205	412	65	83	358	11.8	848	11.5	1	*
11.99	1438	748	690	318	235	225	338	208	415	65	78	366	12.1	878	12.0	1	*
12.49	1463	756	707	324	239	230	356	210	424	61	74	380	12.4	878	12.0	1	*
12.74	1473	758	715	324	240	232	354	205	427	60	71	380	12.4	878	12.0	2	*
12.99	1482	762	720	327	241	233	368	211	426	63	72	380	12.4	878	12.0	2	*
13.20	1492	764	728	327	243	236	367	207	420	59	66	386	12.6	900	12.3	2	*
13.49	1503	768	735	325	243	238	382	215	433	63	79	386	12.6	900	12.3	2	*
13.73	1515	769	746	333	244	239	393	212	447	63	78	386	12.6	919	12.6	2	*
13.98	1528	774	754	337	249	240	413	220	467	74	75	386	12.6	978	13.8	2	*
14.19	1540	779	761	340	250	243	417	223	457	75	77	394	12.8	978	13.8	3	*
14.48	1560	794	766	345	258	244	446	230	480	82	102	417	13.2	978	13.8	3	*
14.73	1576	797	779	350	257	248	447	230	471	70	87	417	13.2	978	13.8	3	*
14.98	1594	807	787	356	260	251	465	231	470	76	80	498	14.1	978	13.8	4	*
15.21	1612	815	797	359	262	254	463	232	470	69	68	517	14.2	991	14.2	4	*
15.99	1681	856	825	376	279	258	591	269	543	107	101	605	15.0	999	15.0	5	*
16.99	1714	885	829	388	282	261	584	256	527	85	74	739	15.9	999	15.0	5	*
19.06	1719	886	833	405	286	261	594	270	518	91	81	999	18.1	999	15.0	5	*
20.04	1735	902	833	406	286	261	632	283	538	108	93	999	18.1	999	15.0	5	*
21.07	1735	906	829	410	287	262	673	295	567	147	105	***	****	***	****	5	*

NO.32 NORMAL MALE SOMATOTYPE:3.0,3.5,4.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
5.13	1079	625	454	249	167	169	189	183	342	50	89	167	5.1	206	3.2	1	1
5.52	1095	631	464	249	170	169	198	185	351	55	110	172	5.3	206	3.2	1	1
5.98	1122	641	481	260	173	172	207	188	354	52	105	191	6.0	206	3.2	1	1
6.51	1148	655	493	266	178	177	214	187	355	49	90	194	6.1	252	4.5	1	1
6.99	1176	658	518	272	182	179	222	187	356	45	91	198	6.2	312	5.4	1	1
7.53	1210	672	538	273	183	185	231	186	364	45	80	204	6.5	346	5.9	1	1
7.99	1234	682	552	280	185	189	241	190	369	50	76	242	7.9	352	5.9	1	1
8.53	1267	700	567	283	188	193	252	191	381	46	74	245	7.9	407	6.6	1	1
8.99	1289	713	576	290	193	196	266	193	393	45	70	253	8.2	485	7.4	1	1
9.52	1318	719	599	296	194	200	273	191	384	44	70	259	8.5	519	7.8	1	1
9.98	1345	732	613	302	200	207	293	202	402	49	80	273	9.0	579	8.5	2	1
10.52	1372	744	628	310	202	209	311	206	410	50	83	273	9.0	636	9.1	2	1
10.98	1399	749	650	317	207	215	328	216	418	51	82	282	9.3	675	9.5	2	1
11.25	1411	754	657	318	208	218	332	213	429	47	71	286	9.5	675	9.5	2	1
11.52	1427	756	671	319	212	220	342	215	427	48	74	317	10.5	732	10.1	2	1
11.77	1437	758	679	320	216	222	352	220	433	57	81	322	10.6	821	11.1	2	1
11.98	1447	766	681	322	213	223	347	215	428	49	76	322	10.6	821	11.1	2	1
12.26	1459	771	688	326	216	222	371	220	442	53	72	350	11.6	821	11.1	2	1
12.51	1468	773	695	328	219	225	376	222	444	58	80	362	11.9	843	11.4	3	1
12.76	1485	780	705	332	221	227	386	232	442	57	84	370	12.2	855	11.6	3	1
12.97	1504	795	709	335	221	230	401	233	458	62	87	370	12.2	855	11.6	4	2
13.53	1549	819	730	348	230	233	457	242	473	56	83	***	****	***	****	4	3
13.76	1573	831	742	355	234	237	473	247	476	63	81	***	****	***	****	5	4
13.98	1600	845	755	357	235	241	470	240	468	62	70	***	****	***	****	5	4
14.27	1626	859	767	366	242	243	512	250	485	64	84	***	****	***	****	5	4
14.52	1653	869	784	369	242	244	523	252	478	58	72	***	****	***	****	5	4
14.77	1675	882	793	376	247	248	544	254	499	64	71	***	****	***	****	5	5
14.98	1686	897	789	377	248	248	535	255	485	61	65	***	****	***	****	5	5
15.52	1712	913	799	386	261	247	553	257	489	68	64	***	****	***	****	5	5
15.98	1727	918	809	389	257	247	554	259	487	69	67	***	****	***	****	5	5
16.96	1739	931	808	399	253	247	571	268	485	65	63	***	****	***	****	5	5
17.99	1749	934	815	395	253	246	589	269	492	66	58	***	****	***	****	5	5
18.97	1752	941	811	409	263	247	605	274	493	73	60	***	****	***	****	5	5

NO.33 NORMAL MALE SOMATOTYPE:3.0,3.5,4.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
4.53	1051	594	457	237	***	***	168	***	***	***	***	***	****	***	****	1	1
4.99	1080	607	473	244	***	***	179	***	***	***	***	***	****	***	****	1	1
5.51	1119	629	490	252	***	***	177	***	***	***	***	***	****	***	****	1	1
6.00	1148	644	504	252	***	***	197	***	***	***	***	191	6.0	364	6.1	1	1
6.50	1177	653	524	260	187	***	213	***	***	***	***	202	6.4	421	6.8	1	1
7.00	1200	667	533	260	190	***	215	***	***	***	***	206	6.6	***	****	1	1
7.49	1228	674	554	264	194	***	229	***	***	***	***	210	6.7	500	7.6	1	1
7.99	1257	687	570	270	199	197	231	***	***	***	***	210	6.7	552	8.2	1	1
8.53	1284	696	588	275	202	201	240	***	***	***	***	254	8.3	609	8.8	1	1
8.99	1309	705	604	281	204	204	254	***	***	***	***	257	8.4	629	9.0	1	1
9.52	1334	713	621	284	213	212	263	***	***	***	***	263	8.6	749	10.3	1	1
9.99	1362	728	634	286	214	214	284	***	***	43	62	266	8.7	769	10.5	1	1
10.52	1390	733	657	291	215	222	290	***	***	40	54	282	9.3	787	10.7	1	1
11.00	1419	744	675	295	218	224	306	182	395	43	55	339	11.2	820	11.1	1	1
11.52	1437	756	681	306	222	228	320	192	391	48	61	343	11.4	***	****	2	1
12.00	1465	768	697	309	226	233	336	196	405	45	60	358	11.8	870	11.8	2	1
12.24	1473	769	704	313	227	235	336	197	392	43	55	358	11.8	887	12.1	3	1
12.52	1494	777	717	314	231	239	354	202	398	46	57	373	12.3	925	12.7	3	1
12.72	1505	787	718	317	232	242	368	200	406	49	58	373	12.3	965	13.4	3	1
12.99	1525	792	733	319	235	243	375	197	410	47	55	395	12.8	978	13.8	3	1
13.26	1545	798	747	326	239	247	381	204	405	48	52	415	13.1	978	13.8	3	2
13.53	1568	815	753	330	245	249	404	207	421	53	51	426	13.3	991	14.2	4	3
13.74	1589	825	764	337	248	251	428	215	434	55	52	436	13.4	999	15.0	4	3
13.99	1612	833	779	340	249	252	446	216	437	55	52	495	14.1	999	15.0	4	3
14.24	1636	849	787	345	253	256	464	225	440	53	50	526	14.3	999	15.0	4	3
14.53	1657	861	796	353	256	262	474	222	437	53	40	526	14.3	999	15.0	5	4
14.74	1668	875	793	354	258	259	491	228	446	54	46	***	****	***	****	5	4
14.99	1685	882	803	355	258	261	507	232	458	55	47	624	15.2	999	15.0	5	4
15.98	1717	913	804	376	270	261	558	241	476	65	60	***	****	***	****	5	5
17.00	1734	925	809	379	273	264	541	239	464	63	50	999	18.1	999	15.0	5	5
18.00	1734	930	804	387	276	265	572	250	485	68	53	999	18.1	999	15.0	5	5
18.99	1735	934	801	390	276	266	586	248	489	66	52	***	****	***	****	5	5

NO.34 NORMAL MALE SOMATOTYPE:3.5,3.5,4.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
5.51	1076	604	472	249	***	***	175	***	***	***	***	***	****	***	****	1	1
6.02	1113	614	499	258	***	***	184	***	***	***	***	***	****	***	****	1	1
6.53	1144	623	521	263	***	***	193	***	***	***	***	190	5.9	261	4.6	1	1
7.03	1172	635	537	268	185	***	202	***	***	***	***	206	6.6	261	4.6	1	1
7.52	1198	648	550	277	190	***	222	***	***	***	***	211	6.8	261	4.6	1	1
8.00	1228	666	562	281	195	***	240	***	***	***	***	226	7.3	412	6.7	1	1
8.51	1262	676	586	287	196	***	252	***	***	***	***	240	7.8	***	****	1	1
9.04	1287	682	605	292	205	190	254	***	***	***	***	240	7.8	435	6.9	1	1
9.51	1315	694	621	298	207	188	272	***	***	***	***	255	8.3	446	7.0	2	1
10.01	1348	713	635	305	212	201	290	***	***	***	***	255	8.3	486	7.4	2	1
10.51	1380	720	660	315	216	204	311	***	***	51	66	262	8.6	538	8.0	3	1
10.99	1413	740	673	323	218	212	329	***	***	53	72	289	9.5	689	9.6	3	1
11.51	1458	764	694	332	227	219	354	***	***	55	67	326	10.8	784	10.7	4	2
11.78	1490	778	712	338	230	221	370	217	419	54	64	***	****	***	****	4	3
12.02	1510	788	722	342	233	227	381	217	422	53	55	373	12.3	877	11.9	4	3
12.29	1542	806	736	351	241	228	406	228	428	58	55	494	14.1	877	11.9	5	4
12.52	1565	813	752	357	248	234	429	235	444	65	61	494	14.1	943	13.0	5	4
12.77	1585	834	751	364	246	234	459	244	459	71	67	551	14.6	978	13.8	5	4
13.02	1604	841	763	368	247	234	470	245	460	64	58	559	14.7	991	14.2	5	4
13.29	1618	849	769	374	254	234	490	245	460	70	61	598	15.0	991	14.2	5	4
13.50	1630	856	774	377	252	235	488	249	463	68	55	612	15.1	991	14.2	5	5
14.04	1648	871	777	378	255	239	502	257	455	72	51	767	16.1	999	15.0	5	5
14.52	1655	878	777	388	259	237	536	262	485	80	64	928	17.1	999	15.0	5	5
15.01	1662	888	774	388	256	237	532	257	469	75	54	973	17.4	999	15.0	5	5
16.01	1671	891	780	393	264	240	555	270	494	84	66	999	18.1	999	15.0	5	5
17.03	1677	898	779	402	264	240	551	276	479	83	56	999	18.1	999	15.0	5	5
18.00	1676	894	782	402	265	239	549	274	477	91	64	999	18.1	999	15.0	5	5

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
NO.35 NORMAL FEMALE SOMATOTYPE:4.0,3.5,3.0																	
5.00	1082	603	479	252	***	***	193	***	***	***	***	***	****	***	****	1	1
5.50	1120	629	491	253	***	***	197	***	***	***	***	***	****	***	****	1	1
6.00	1155	647	508	265	***	***	206	***	***	***	***	***	****	***	****	1	1
6.50	1186	652	534	265	***	***	222	***	***	***	***	***	****	***	****	1	1
7.01	1225	682	543	274	193	***	234	***	***	***	***	314	7.2	594	7.4	1	1
7.51	1254	694	560	277	195	***	254	***	***	***	***	314	7.2	628	7.8	1	1
8.01	1288	708	580	285	201	***	270	***	***	***	***	335	7.9	687	8.4	1	1
8.51	1317	722	595	292	204	211	279	***	***	***	***	365	8.7	704	8.5	1	1
9.00	1337	727	610	294	207	212	295	***	***	***	***	416	9.7	749	8.9	1	1
9.48	1370	736	634	301	214	220	313	***	***	***	***	463	10.4	823	9.5	2	1
9.71	1385	740	645	303	215	223	313	***	***	***	***	483	10.7	877	10.0	2	1
10.00	1409	745	664	312	217	232	345	***	***	54	80	483	10.7	952	11.0	2	1
10.25	1425	757	668	317	221	230	347	***	***	59	88	505	11.0	952	11.0	3	1
10.50	1454	776	678	321	227	233	367	***	***	61	85	524	11.3	963	11.2	4	1
10.71	1476	784	692	322	232	235	367	***	***	58	82	570	11.9	976	11.5	4	2
11.00	1500	806	694	328	237	240	399	***	***	67	81	594	12.1	992	12.2	4	2
11.27	1519	814	705	333	241	240	408	***	***	65	79	641	12.6	999	13.0	4	3
11.49	1535	825	710	335	240	239	417	215	461	66	85	648	12.7	999	13.0	4	3
11.72	1550	834	716	342	246	241	426	218	466	70	81	648	12.7	999	13.0	4	4
12.01	1569	837	732	348	250	242	470	234	495	83	102	692	13.2	999	13.0	4	4
12.26	1580	851	729	345	251	245	481	240	503	84	97	699	13.2	999	13.0	4	4
12.49	1588	858	730	352	254	248	488	240	505	74	98	709	13.3	999	13.0	4	4
13.01	1595	860	735	355	263	248	511	244	515	76	103	748	13.7	999	13.0	4	4
13.51	1607	861	746	361	262	248	529	250	530	94	108	850	14.6	999	13.0	4	4
14.01	1612	871	741	364	267	248	536	251	535	85	140	923	15.1	999	13.0	4	4
14.50	1622	879	743	364	263	250	556	262	550	90	147	928	15.1	999	13.0	4	4
15.01	1625	876	749	368	267	247	584	275	572	101	172	996	15.8	999	13.0	4	4
15.50	1626	883	743	368	273	251	595	279	582	113	180	999	16.0	999	13.0	4	4
16.00	1628	892	736	371	273	251	598	276	582	120	190	999	16.0	999	13.0	5	5
16.99	1634	895	739	373	270	252	588	280	570	114	205	999	16.0	999	13.0	5	5
17.99	1634	890	744	374	269	252	557	265	544	96	147	999	16.0	999	13.0	5	5
19.01	1632	891	741	373	271	251	594	288	585	107	190	999	16.0	999	13.0	5	5
25.03	1633	896	737	373	276	250	617	295	594	125	214	***	****	***	****	5	5
NO.36 NORMAL FEMALE SOMATOTYPE:5.5,3.0,2.5																	
4.13	1040	590	450	237	182	157	186	188	355	83	105	225	4.1	363	4.7	1	1
4.53	1079	616	463	247	188	166	207	190	372	90	124	271	5.8	386	4.9	1	1
5.06	1125	633	492	252	193	171	218	187	378	83	104	280	6.1	444	5.7	1	1
5.55	1162	655	507	260	198	175	232	192	387	73	105	309	7.0	497	6.3	1	1
6.05	1194	660	534	265	200	185	243	197	400	84	102	323	7.5	550	6.8	1	1
6.55	1227	682	545	269	205	187	253	190	400	67	100	330	7.7	550	6.8	1	1
7.05	1255	690	565	274	206	194	264	195	411	68	97	337	7.9	614	7.6	1	1
7.55	1282	707	575	280	212	195	281	201	424	71	94	344	8.2	682	8.3	1	1
8.04	1312	709	603	286	218	202	295	200	426	70	102	363	8.6	702	8.5	1	1
8.54	1340	725	615	293	220	204	307	202	429	74	100	377	9.0	702	8.5	1	1
9.04	1368	735	633	296	223	213	324	205	434	80	97	398	9.4	776	9.1	1	1
9.56	1399	750	649	301	228	216	334	208	440	76	100	406	9.6	853	9.8	1	1
10.04	1423	758	665	308	232	221	347	208	452	68	100	435	10.0	875	10.0	1	1
10.56	1451	773	678	314	236	224	372	215	460	70	101	482	10.7	929	10.7	1	1
10.77	1460	773	687	315	238	225	373	217	470	70	97	507	11.0	952	11.0	2	1
11.06	1474	778	696	315	239	227	388	218	471	76	107	528	11.3	952	11.0	2	1
11.30	1489	789	700	320	244	232	412	226	486	78	102	558	11.7	952	11.0	3	2
11.55	1506	798	708	324	245	233	418	224	484	76	107	572	11.9	979	11.6	3	2
11.76	1515	799	716	325	248	233	419	229	490	77	106	627	12.5	979	11.6	3	2
12.05	1534	801	733	329	250	237	441	233	496	74	115	627	12.5	992	12.2	3	2
12.30	1548	812	736	330	257	238	455	229	497	85	111	641	12.6	992	12.2	3	2
12.57	1566	820	746	342	261	241	475	236	511	93	110	641	12.6	999	13.0	3	3
12.76	1578	828	750	342	263	245	482	234	514	86	104	648	12.7	999	13.0	3	3
13.03	1592	831	761	343	262	244	487	232	511	77	100	648	12.7	999	13.0	3	3
13.30	1607	844	763	344	267	247	522	237	525	91	100	648	12.7	999	13.0	5	4
13.55	1621	851	770	348	271	247	541	242	548	90	113	652	12.8	999	13.0	5	4
13.76	1629	856	773	353	274	246	557	249	550	82	113	670	12.9	999	13.0	5	4
14.04	1637	863	774	356	278	247	583	258	565	101	124	742	13.6	999	13.0	5	4
14.29	1649	868	781	363	282	247	619	259	586	122	132	752	13.7	999	13.0	5	5
14.54	1657	870	787	364	280	***	635	265	587	122	146	779	14.0	999	13.0	5	5
14.75	1661	875	786	367	282	247	641	262	586	120	142	790	14.1	999	13.0	5	5
15.12	1664	885	779	367	287	246	656	270	601	116	150	833	14.5	999	13.0	5	5
15.54	1671	887	784	372	287	248	670	279	605	127	160	***	****	***	****	5	5
16.06	1677	897	780	375	289	247	685	279	617	160	164	***	****	***	****	5	5
17.07	1678	899	779	374	292	248	666	272	613	146	157	***	****	***	****	5	5
18.07	1689	906	783	373	293	247	672	274	600	172	152	***	****	***	****	5	5
20.08	1685	895	790	373	294	246	634	270	587	114	134	***	****	***	****	5	5
NO.37 NORMAL FEMALE SOMATOTYPE:3.5,3.0,4.0																	
5.55	1079	615	464	247	178	168	179	***	***	61	80	310	7.1	451	5.7	1	1
6.03	1107	623	484	250	179	169	184	170	338	69	76	321	7.4	528	6.6	1	1
6.55	1133	634	499	257	187	176	190	170	356	65	73	335	7.9	556	6.9	1	1
7.03	1163	657	506	257	188	178	197	171	350	63	81	335	7.9	556	6.9	1	1
7.55	1184	662	522	268	192	182	202	171	350	65	78	344	8.1	576	7.2	1	1
8.02	1213	676	537	270	194	188	213	170	360	62	86	367	8.7	643	8.0	1	1
8.56	1235	685	550	274	199	192	225	176	369	72	84	390	9.3	717	8.6	1	1
9.02	1258	691	567	277	199	193	226	178	362	60	74	390	9.3	771	9.1	1	1
9.56	1280	698	582	284	204	201	239	178	367	60	74	464	10.4	832	9.6	1	2
10.02	1304	706	598	286	206	203	246	175	373	70	68	500	10.9	877	10.0	1	2
10.58	1342	725	617	298	216	210	264	180	381	65	75	538	11.5	***	****	2	3
10.77	1352	728	624	301	216	210	273	183	390	73	82	565	11.8	952	11.0	2	3
11.02	1372	737	635	303	217	212	275	180	393	60	80	575	11.9	981	11.7	3	4
11.29	1391	739	652	307	219	214	279	178	389	54	65	664	12.9	981	11.7	3	4
11.57	1419	760	659	313	221	216	296	183	410	69	67	664	12.9	981	11.7	3	4
11.78	1429	768	661	318	223	217	309	187	413	63	67	664	12.9	999	13.0	3	4
12.03	1443	773	670	320	225	220	320	190	419	73	76	664	12.9	999	13.0	3	4
12.26	1453	784	669	325	228	223	334	195	428	70	75	674	13.0	999	13.0	3	4
12.57	1472	790	682	330	231	224	354	199	434	74	72	685	13.1	999	13.0	3	5
12.78	1481	800	681	334	233	225	367	203	444	75	80	712	13.4	999	13.0	4	5
13.03	1497	805	692	335	233	228	360	197	442	70	80	719	13.4	999	13.0	4	5
13.26	1502	809	693	336	235	228	367	201	442	65	70	742	13.6	999	13.0	4	5
NO.37 NORMAL FEMALE SOMATOTYPE:3.5,3.0,4.0																	
13.59	1514	813	701	339	237	227	377	205	447	80	71	762	13.8	999	13.0	5	5
13.78	1520	830	690	340	238	227	376	202	452	76	76	762	13.8	999	13.0	5	5
14.03	1525	827	698	343	242	229	393	206	455	86	74	804	14.2	***	****	5	5
14.27	1528	829	699	347	245	232	422	225	480	106	97	823	14.4	999	13.0	5	5
14.56	1534	830	704	348	248	228	425	223	481	117	107	897	15.0	999	13.0	5	5
15.02	1538	836	702	348	246	229	415	222	476	101	96	984	15.6	999	13.0	5	5
15.56	1540	837	703	351	247	229	430	227	482	122	103	991	15.7	999	13.0	5	5
17.02	1549	842	707	353	250	229	426	223	487	113	87	999	16.0	999	13.0	5	5
19.03	1548	845	703	353	247	226	415	214	465	93	67	***	****	***	****	5	5
20.03	1544	844	700	353	248	227	415	212	458	97	63	***	****	***	****	5	5
NO.38 NORMAL FEMALE SOMATOTYPE:4.0,3.0,5.0																	
5.53	1102	614	488	234	185	170	177	***	***	46	69	258	5.3	521	6.5	1	1
5.99	1135	623	512	230	186	174	177	160	321	40	57	271	5.8	560	7.0	1	1
6.53	1162	635	527	250	191	179	195	173	346	45	72	301	6.8	585	7.3	1	1
7.05	1187	642	545	252	194	183	197	172	345	41	56	301	6.8	632	7.8	1	1
7.53	1215	658	557	257	199	189	213	174	360	46	65	315	7.3	682	8.3	1	1
7.97	1240	664	576	262	200	191	209	172	351	40	63	325	7.6	702	8.5	1	1
8.52	1263	677	586	264	202	196	229	173	366	40	64	332	7.8	743	8.8	1	1
8.98	1291	681	610	273	206	197	245	182	373	49	63	351	8.3	834	9.6	1	1
9.52	1314	697	617	280	212	202	244	178	368	44	64	351	8.3	850	9.8	1	1
9.98	1343	709	634	284	214	205	262	184	386	48	75	380	9.1	873	10.0	1	1
10.52	1365	715	650	293	219	208	279	197	403	54	77	396	9.4	888	10.2	1	1
10.99	1383	720	663	297	221	213	281	197	395	53	70	448	10.2	947	10.9	1	1
11.51	1409	726	683	304	225	213	296	197	405	53	78	468	10.5	968	11.3	1	1
11.74	1416	731	685	306	228	218	300	198	399	50	73	475	10.6	968	11.3	1	1
11.99	1428	736	692	309	230	219	312	200	409	54	75	475	10.6	981	11.7	1	1
12.24	1437	743	694	309	231	219	315	203	412	57	77	475	10.6	981	11.7	1	1
12.53	1448	746	702	312	234	219	320	202	415	54	72	498	10.9	981	11.7	1	1
12.74	1458	750	708	316	236	222	324	199	418	50	68	530	11.4	981	11.7	1	1
13.03	1472	757	715	316	239	226	332	207	422	53	75	553	11.7	992	12.2	1	2
13.26	1488	762	726	318	242	225	351	212	429	55	81	563	11.8	999	13.0	2	2
13.52	1506	779	727	320	246	225	364	211	442	60	72	563	11.8	999	13.0	2	2
13.98	1534	793	741	333	253	232	393	220	453	64	82	618	12.3	999	13.0	3	2
14.25	1557	796	761	335	256	233	407	230	464	61	82	682	13.1	999	13.0	4	3
14.52	1574	809	765	340	260	237	430	230	476	78	87	695	13.2	999	13.0	4	4
14.73	1587	823	764	346	266	237	436	233	485	72	85	699	13.2	999	13.0	4	4
14.98	1598	833	765	348	271	236	450	236	491	76	90	740	13.6	999	13.0	4	4
15.52	1616	844	772	353	275	236	483	243	513	81	100	***	****	***	****	5	5
15.96	1625	851	774	354	278	240	485	245	517	74	115	843	14.6	999	13.0	5	5
18.03	1637	866	771	358	289	237	537	266	549	116	135	***	****	***	****	5	5
NO.39 NORMAL FEMALE SOMATOTYPE:4.0,3.0,4.0																	
3.52	924	552	372	218	161	144	138	163	309	55	80	163	2.5	257	3.5	1	1
4.07	974	569	405	224	168	150	149	168	322	67	74	***	****	***	****	1	1
4.53	999	582	417	235	172	155	157	164	322	59	85	200	3.4	351	4.5	1	1
5.07	1035	600	435	242	177	161	162	168	321	50	66	221	4.0	364	4.7	1	1
5.53	1064	607	457	248	181	163	178	173	342	60	78	247	4.8	424	5.4	1	1
6.09	1109	626	483	256	186	172	197	174	343	51	73	252	5.0	451	5.7	1	1
6.52	1132	635	497	262	189	175	195	174	346	50	78	256	5.2	504	6.3	1	1
7.06	1166	648	518	271	194	183	209	183	365	59	66	269	5.7	560	7.0	1	1
7.52	1198	659	539	274	198	187	217	183	378	55	72	269	5.7	584	7.3	1	1
8.06	1230	669	561	282	202	191	224	183	359	48	63	323	7.5	609	7.5	1	1
8.52	1252	678	574	287	206	196	243	190	387	57	77	345	8.2	779	9.2	1	1
9.05	1282	694	588	295	209	200	252	194	385	54	64	357	8.5	779	9.2	1	1
9.27	1292	698	594	297	211	200	262	196	397	61	71	372	8.9	779	9.2	1	1
9.51	1307	700	607	299	212	204	268	195	407	58	64	391	9.3	855	9.8	1	1
9.86	1324	711	613	303	216	208	276	199	407	61	66	399	9.4	877	10.0	1	1
10.05	1334	712	622	306	216	208	279	198	404	62	62	443	10.1	893	10.2	1	1
10.26	1344	717	627	306	218	211	283	201	412	64	73	472	10.6	893	10.2	1	1
10.53	1365	728	637	310	218	213	297	203	418	68	78	***	****	***	****	1	1
10.76	1370	729	641	313	221	214	305	207	424	64	79	***	****	***	****	1	1
11.07	1387	735	652	315	222	217	318	212	439	80	71	***	****	***	****	1	1
11.28	1399	737	662	318	226	218	328	215	450	85	72	***	****	***	****	1	1
11.53	1411	744	667	321	227	219	349	219	457	109	93	***	****	***	****	1	1
11.79	1428	748	680	324	229	223	346	218	454	100	86	***	****	***	****	1	1
12.06	1439	754	685	326	232	227	352	221	450	100	82	***	****	***	****	1	1
12.27	1453	755	698	328	233	227	355	218	455	91	77	***	****	***	****	1	1
12.52	1471	764	707	330	237	231	358	220	459	84	74	***	****	***	****	1	1
12.85	1486	765	721	335	239	231	359	210	445	65	61	***	****	***	****	1	2
13.08	1504	772	732	338	243	***	364	212	450	66	59	***	****	***	****	1	2
13.27	1518	788	730	341	246	233	385	220	464	79	65	***	****	***	****	2	3
13.52	1534	795	739	346	249	234	418	230	488	83	80	***	****	***	****	2	3
13.75	1548	797	751	350	253	236	454	238	504	94	107	***	****	***	****	2	3
14.09	1575	809	766	359	261	240	468	243	514	85	100	***	****	***	****	4	4
14.24	1586	809	777	362	266	244	493	245	535	101	110	***	****	***	****	4	4
14.55	1608	820	788	368	275	245	534	248	554	120	142	***	****	***	****	5	5
14.80	1623	832	791	372	273	243	532	251	545	106	114	***	****	***	****	5	5
15.09	1633	838	795	376	279	247	534	252	534	93	110	***	****	***	****	5	5
15.61	1648	847	801	379	283	246	528	252	536	71	77	***	****	***	****	5	5
16.09	1654	853	801	381	285	246	522	244	539	90	103	***	****	***	****	5	5
17.09	1659	862	797	387	295	246	614	275	596	135	177	***	****	***	****	5	5
NO.40 NORMAL FEMALE SOMATOTYPE:5.0,1.5,4.0																	
5.50	1145	635	510	255	181	176	195	170	341	45	67	321	7.4	527	6.6	1	1
6.04	1181	650	531	260	184	181	206	174	346	51	71	325	7.6	527	6.6	1	1
6.50	1207	662	545	265	189	185	222	175	365	45	67	353	8.4	566	7.1	1	1
7.03	1244	676	568	275	195	194	238	180	376	47	64	372	8.9	639	7.9	1	1
7.49	1276	688	588	278	198	200	246	180	373	45	62	401	9.5	705	8.5	1	1
8.03	1315	699	616	285	204	205	265	185	388	50	67	416	9.7	773	9.1	1	1
8.49	1343	716	627	294	211	211	291	194	405	56	77	465	10.5	817	9.5	1	1
9.03	1368	726	642	300	211	214	309	199	419	63	85	503	11.0	891	10.2	1	1
9.49	1401	733	668	304	215	218	315	200	414	60	79	517	11.2	929	10.7	1	1
NO.40 NORMAL FEMALE SOMATOTYPE:5.0,1.5,4.0																	
9.78	1409	737	672	303	215	220	306	197	413	56	78	568	11.8	965	11.3	1	1
10.02	1427	744	683	307	219	222	328	203	420	63	77	628	12.5	981	11.7	1	1
10.27	1439	755	684	308	220	223	336	201	430	61	78	628	12.5	981	11.7	1	1
10.48	1451	760	691	313	220	226	347	206	426	55	81	628	12.5	981	11.7	1	1
10.85	1462	762	700	315	223	228	370	210	450	69	95	692	13.2	981	11.7	1	1
11.04	1475	774	701	319	227	228	383	216	452	67	104	***	****	***	****	1	1
11.27	1488	775	713	320	229	232	394	216	457	72	110	***	****	***	****	1	1
11.48	1497	781	716	323	234	233	424	235	477	90	125	***	****	***	****	1	1
11.79	1519	792	727	329	242	237	460	247	504	112	165	***	****	***	****	2	1
12.04	1532	798	734	331	243	237	481	248	509	113	157	***	****	***	****	2	1
12.28	1547	802	745	337	246	241	473	245	505	117	141	***	****	***	****	2	1
12.50	1567	808	759	336	242	240	454	234	480	81	113	***	****	***	****	3	2
12.80	1586	822	764	346	251	243	505	245	515	92	131	***	****	***	****	3	3
13.03	1611	835	776	351	257	245	547	256	546	122	162	***	****	***	****	4	3
13.28	1623	842	781	354	257	245	577	263	556	121	164	***	****	***	****	4	4
13.49	1636	857	779	358	265	250	586	271	563	118	155	***	****	***	****	4	4
13.80	1656	859	797	358	265	248	569	257	553	97	147	***	****	***	****	5	4
14.03	1661	866	795	359	266	251	587	260	563	113	167	***	****	***	****	5	4
14.28	1665	873	792	367	270	247	620	268	577	125	193	***	****	***	****	5	4
14.47	1674	875	799	369	269	247	641	275	584	135	197	***	****	***	****	5	5
14.82	1676	882	794	371	269	247	619	270	582	123	178	***	****	***	****	5	5
14.99	1674	877	797	369	266	246	618	266	577	115	164	***	****	***	****	5	5
15.54	1680	881	799	368	264	249	607	266	560	113	162	***	****	***	****	5	5
16.15	1688	887	801	368	262	245	584	255	545	90	126	***	****	***	****	5	5
17.17	1691	900	791	370	262	246	596	255	546	101	131	***	****	***	****	5	5
NO.41 NORMAL FEMALE SOMATOTYPE:5.0,1.0,4.0																	
5.05	1059	600	459	238	189	159	165	170	352	55	100	224	4.1	404	5.2	1	1
5.55	1088	613	475	243	199	161	181	173	363	66	122	241	4.6	415	5.3	1	1
6.03	1111	620	491	245	200	163	180	174	362	57	107	241	4.6	493	6.2	1	1
6.55	1150	636	514	253	204	166	194	177	371	70	128	283	6.2	504	6.3	1	1
7.03	1177	646	531	259	209	170	212	188	393	70	128	303	6.8	504	6.3	1	1
7.55	1215	661	554	267	212	175	217	193	399	63	123	318	7.3	575	7.2	1	1
8.04	1242	671	571	269	215	180	223	184	387	52	130	344	8.1	619	7.7	1	1
8.54	1272	681	591	272	221	181	228	186	399	55	121	351	8.3	676	8.3	1	1
9.04	1301	695	606	282	227	185	239	187	403	57	132	395	9.4	704	8.5	1	1
9.33	1316	702	614	284	227	190	250	190	412	62	123	431	9.9	782	9.2	1	1
9.56	1324	704	620	288	228	190	254	194	422	60	145	460	10.4	848	9.8	1	1
9.79	1338	710	628	290	230	193	265	193	431	63	140	466	10.5	886	10.1	1	1
10.02	1354	714	640	294	234	192	275	201	436	76	160	474	10.6	907	10.4	1	1
10.32	1370	724	646	295	237	196	286	208	437	73	145	474	10.6	907	10.4	1	1
10.54	1380	729	651	300	238	199	286	202	438	70	160	474	10.6	907	10.4	1	1
10.78	1393	733	660	301	240	199	291	205	440	73	148	495	10.9	952	11.0	1	1
11.05	1408	736	672	304	242	198	307	211	458	80	163	517	11.2	952	11.0	1	1
11.32	1424	744	680	307	245	202	313	215	461	87	164	517	11.2	952	11.0	1	1
11.53	1425	743	682	308	244	203	299	201	440	66	124	517	11.2	981	11.7	1	1
11.80	1443	750	693	311	246	203	297	200	431	62	120	***	****	***	****	1	1
12.03	1456	760	696	313	248	205	306	200	441	60	119	***	****	***	****	1	1
12.34	1468	764	704	315	251	206	319	206	450	64	124	***	****	***	****	1	1
12.55	1479	765	714	316	253	206	329	205	462	74	125	***	****	***	****	1	1
12.80	1493	771	722	318	256	207	346	220	475	82	165	***	****	***	****	1	1
13.06	1505	779	726	321	259	210	360	221	481	102	146	***	****	***	****	1	1
13.33	1523	793	730	324	264	213	376	225	490	100	152	***	****	***	****	2	2
13.54	1532	790	742	327	268	214	391	229	495	98	162	***	****	***	****	2	3
13.79	1553	801	752	332	271	213	396	222	495	102	140	***	****	***	****	3	3
14.12	1577	812	765	333	274	214	388	214	479	67	110	***	****	***	****	3	4
14.35	1598	824	774	338	277	***	406	221	490	85	126	***	****	***	****	3	4
14.54	1601	829	772	341	282	219	438	234	520	107	170	***	****	***	****	4	4
14.79	1615	839	776	344	284	220	474	246	549	132	190	***	****	***	****	4	4
15.11	1619	843	776	347	292	***	491	249	557	120	200	***	****	***	****	5	5
15.50	1634	847	787	350	295	220	500	252	555	115	204	***	****	***	****	5	5
16.07	1642	853	789	351	300	220	495	254	545	134	194	***	****	***	****	5	5
17.05	1651	861	790	355	304	220	531	274	572	144	230	***	****	***	****	5	5
NO.42 NORMAL FEMALE SOMATOTYPE:6.0,2.0,2.0																	
3.49	980	566	414	237	***	***	168	***	***	***	***	***	****	***	****	1	1
4.02	1022	593	429	236	***	***	181	***	***	***	***	***	****	***	****	1	1
4.49	1070	620	450	240	174	***	186	***	***	***	***	283	6.2	415	5.3	1	1
5.02	1107	630	477	252	177	***	200	***	***	***	***	295	6.6	433	5.5	1	1
5.50	1147	650	497	256	184	***	206	***	***	***	***	306	6.9	504	6.3	1	1
6.03	1176	664	512	262	190	179	218	***	***	***	***	313	7.2	555	6.9	1	1
6.47	1207	664	543	269	195	184	222	***	***	***	***	333	7.8	575	7.2	1	1
7.01	1226	672	554	271	196	188	240	***	***	***	***	340	8.0	623	7.7	1	1
7.47	1250	687	563	278	202	192	250	***	***	***	***	340	8.0	623	7.7	1	1
8.01	1283	702	581	287	210	200	274	***	***	64	100	340	8.0	719	8.6	1	1
8.47	1311	720	591	289	212	206	290	***	***	62	97	358	8.5	788	9.2	1	1
9.02	1344	736	608	298	217	210	349	***	***	125	164	371	8.9	848	9.8	1	1
9.48	1375	747	628	305	233	217	352	227	461	102	126	464	10.4	907	10.4	1	1
10.48	1448	780	668	324	249	228	452	259	514	182	164	516	11.2	943	10.8	2	1
11.02	1490	802	688	330	254	233	518	272	537	200	200	587	12.0	965	11.3	2	1
11.48	1536	823	713	339	258	241	531	270	541	204	173	641	12.6	999	13.0	3	1
11.77	1561	834	727	346	263	244	563	269	550	174	150	685	13.1	999	13.0	3	1
12.02	1581	846	735	352	264	244	577	272	556	162	166	685	13.1	999	13.0	3	2
12.26	1593	857	736	354	271	252	596	278	574	166	168	692	13.2	999	13.0	4	3
12.47	1610	859	751	356	273	249	602	277	584	160	158	701	13.3	999	13.0	4	3
12.76	1624	870	754	360	278	248	632	275	584	190	180	720	13.4	999	13.0	5	3
13.01	1628	872	756	362	283	254	644	293	587	164	205	737	13.6	999	13.0	5	3
13.26	1637	881	756	369	295	249	674	297	609	220	225	753	13.8	999	13.0	5	3
13.47	1639	881	758	368	296	249	702	304	614	255	230	801	14.2	999	13.0	5	4
14.01	1649	889	760	368	303	249	751	325	635	275	262	861	14.7	999	13.0	5	4
15.03	1656	889	767	368	293	249	649	286	591	140	153	999	16.0	999	13.0	5	5
15.96	1656	892	764	369	300	257	666	300	608	150	182	999	16.0	999	13.0	5	5
17.02	1657	893	764	376	303	254	669	294	597	146	180	999	16.0	999	13.0	5	5
18.01	1656	892	764	375	298	253	643	284	591	130	175	999	16.0	999	13.0	5	5
19.01	1654	886	768	372	296	***	640	287	591	121	165	999	16.0	999	13.0	5	5
20.01	1657	885	772	372	302	252	643	288	598	136	170	***	****	***	****	5	5

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NO.43 NORMAL FEMALE SOMATOTYPE:6.0,3.0,2.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
2.07	821	513	308	198	135	125	113	***	***	71	83	109	1.8	169	1.4	1	1
2.53	867	531	336	203	143	130	120	162	315	72	110	116	1.9	177	1.8	1	1
3.06	909	546	363	207	150	137	138	167	324	66	100	***	****	***	****	1	1
3.58	944	562	382	219	161	143	143	162	317	62	78	166	2.6	193	2.3	1	1
4.06	979	579	400	224	166	146	159	173	336	85	110	184	3.0	233	3.1	1	1
4.50	1003	586	417	231	171	151	163	172	332	69	100	186	3.0	257	3.5	1	1
5.06	1038	599	439	232	176	157	173	169	344	68	97	200	3.4	257	3.5	1	1
5.52	1065	616	449	241	182	162	180	170	342	66	78	208	3.7	279	3.8	1	1
6.06	1100	625	475	246	186	168	184	165	340	63	78	230	4.3	362	4.7	1	1
6.51	1130	637	493	251	192	173	188	163	342	61	72	237	4.5	420	5.4	1	1
7.05	1166	647	519	260	198	176	200	168	346	55	77	247	4.8	488	6.2	1	1
7.53	1188	663	525	269	202	182	216	175	366	52	77	304	6.9	550	6.9	1	1
8.05	1216	672	544	276	207	189	221	173	362	54	67	308	7.0	632	7.8	1	1
8.53	1244	681	563	278	211	191	238	181	385	51	76	308	7.0	632	7.8	1	1
9.06	1266	694	572	286	214	194	244	182	377	49	66	315	7.2	686	8.4	1	1
9.56	1292	707	585	289	220	201	258	183	390	49	75	334	7.8	726	8.7	1	1
10.06	1316	712	604	299	224	203	273	189	411	53	72	342	8.1	779	9.2	1	1
10.25	1322	717	605	297	225	203	273	186	398	51	67	396	9.4	794	9.3	1	1
10.52	1335	721	614	299	228	205	286	191	414	57	74	396	9.4	815	9.5	1	1
10.79	1353	724	629	303	231	210	297	195	415	56	72	443	10.1	855	9.8	1	1
11.06	1374	736	638	307	236	213	307	195	420	56	73	450	10.2	871	10.0	1	1
11.27	1381	742	639	312	239	215	317	197	427	53	85	465	10.5	871	10.0	2	1
11.52	1399	748	651	316	246	219	327	201	434	63	80	465	10.5	886	10.1	2	1
11.78	1415	753	662	319	249	222	340	207	443	62	79	472	10.6	886	10.1	2	1
12.05	1441	762	679	322	254	224	349	208	439	56	76	483	10.7	945	10.9	2	1
12.26	1459	772	687	327	258	227	363	204	444	65	72	505	11.0	981	11.7	3	1
12.49	1471	786	685	331	263	229	379	208	458	61	72	576	11.9	981	11.7	3	2
12.78	1501	804	697	338	271	231	416	215	478	70	86	620	12.4	999	13.0	3	2
13.05	1519	815	704	344	276	233	429	224	485	76	80	665	12.9	999	13.0	3	3
13.24	1534	823	711	346	279	234	447	216	486	64	77	685	13.1	999	13.0	3	4
13.53	1550	832	718	352	286	238	475	236	515	82	95	692	13.2	999	13.0	4	4
13.78	1567	838	729	356	290	238	501	243	529	96	97	712	13.4	999	13.0	4	4
14.07	1573	840	733	358	292	239	501	237	528	92	98	749	13.7	999	13.0	4	4
14.52	1593	856	737	361	292	239	516	243	535	96	97	***	****	***	****	4	4
15.06	1614	868	746	365	301	239	548	246	545	112	102	***	****	***	****	5	5
15.52	1623	872	751	367	303	239	564	248	557	115	122	***	****	***	****	5	5
16.06	1620	876	744	369	305	239	595	263	568	134	140	***	****	***	****	5	5
17.52	1631	883	748	372	310	239	626	263	581	165	140	***	****	***	****	5	5
19.06	1632	889	743	373	312	239	645	278	588	107	157	***	****	***	****	5	5
20.25	1632	897	735	373	309	239	661	271	597	190	162	***	****	***	****	5	5

NO.44 NORMAL FEMALE SOMATOTYPE:6.0,1.0,2.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
5.03	933	551	382	210	***	***	150	***	***	***	***	210	3.7	239	3.3	1	1
5.54	967	560	407	217	172	***	159	***	***	***	***	215	3.9	305	4.1	1	1
6.03	998	574	424	225	173	***	170	***	***	***	***	234	4.4	331	4.3	1	1
6.53	1039	596	443	228	179	***	181	***	***	***	***	244	4.7	401	5.1	1	1
7.03	1066	602	464	236	178	170	188	***	***	***	***	274	5.9	435	5.5	1	1
7.53	1103	624	479	245	181	176	204	***	***	***	***	303	6.8	497	6.3	1	1
8.01	1120	630	490	250	184	176	209	***	***	***	***	307	7.0	513	6.4	1	1
8.53	1149	644	505	254	190	184	227	***	***	95	106	338	8.0	653	8.1	1	1
9.03	1177	657	520	261	200	186	240	***	***	91	135	344	8.1	746	8.8	1	1
9.52	1204	664	540	265	201	190	250	***	***	108	134	352	8.3	767	9.1	1	1
10.02	1226	678	548	272	199	193	261	205	390	103	143	414	9.7	784	9.2	1	1
10.54	1262	687	575	275	208	199	284	213	418	110	160	427	9.9	832	9.6	1	1
11.02	1291	707	584	279	208	206	295	219	427	116	145	472	10.6	909	10.4	1	1
11.25	1308	708	600	282	214	208	302	214	429	118	146	472	10.6	952	11.0	2	1
11.54	1325	713	612	284	217	210	313	220	444	124	154	500	10.9	952	11.0	2	2
11.78	1340	723	617	286	222	214	327	226	451	132	166	521	11.2	965	11.3	2	2
12.03	1357	733	624	289	222	215	334	224	445	125	167	533	11.4	965	11.3	2	3
12.25	1371	740	631	293	225	217	334	225	447	130	155	533	11.4	976	11.5	2	3
12.53	1390	745	645	295	230	219	356	235	462	132	166	591	12.1	976	11.5	2	3
12.78	1406	749	657	297	231	225	362	231	460	122	160	621	12.4	992	12.2	2	3
13.03	1421	758	663	300	233	226	387	245	477	170	164	681	13.1	999	13.0	3	4
13.24	1434	760	674	303	238	227	399	248	496	154	156	695	13.2	999	13.0	3	4
13.53	1450	775	675	307	241	231	400	243	482	152	164	695	13.2	999	13.0	4	4
13.78	1471	779	692	309	249	232	419	250	498	152	155	695	13.2	999	13.0	4	4
15.12	1515	811	704	327	262	234	459	252	521	166	150	828	14.5	999	13.0	4	5
16.04	1531	818	713	328	264	234	473	250	527	160	154	938	15.2	999	13.0	5	5
17.04	1531	826	705	333	274	233	511	267	563	175	178	999	16.0	999	13.0	5	5
18.03	1529	823	706	335	272	235	495	260	542	152	185	999	16.0	999	13.0	5	5

NO.45 NORMAL FEMALE SOMATOTYPE:6.0,2.0,3.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
5.02	1093	632	461	231	177	175	189	188	339	63	84	301	6.8	395	5.1	1	1
5.57	1129	647	482	238	183	181	197	185	341	72	90	315	7.3	447	5.7	1	1
6.02	1154	657	497	246	185	185	198	184	337	63	75	315	7.3	472	6.0	1	1
6.57	1185	666	519	254	188	190	210	190	345	73	72	315	7.3	548	6.8	1	1
7.03	1211	677	534	256	193	194	218	186	350	70	80	326	7.6	599	7.5	1	1
7.57	1236	683	553	264	198	200	237	198	366	77	85	344	8.2	623	7.7	1	1
8.03	1265	706	559	271	203	203	245	198	370	60	78	350	8.3	658	8.1	1	1
8.59	1286	710	576	273	204	206	260	207	385	76	86	356	8.5	736	8.7	1	1
9.03	1315	722	593	280	208	213	274	205	393	71	82	398	9.4	796	9.3	1	1
9.56	1344	728	616	282	210	218	290	219	404	80	91	398	9.4	856	9.8	1	1
9.77	1354	734	620	287	212	219	296	217	409	86	91	398	9.4	871	10.0	1	1
10.02	1367	743	624	288	215	221	307	214	420	70	83	434	10.0	871	10.0	1	1
10.27	1378	749	629	293	219	224	303	215	404	67	78	475	10.6	909	10.4	1	1
10.56	1396	754	642	296	219	227	320	221	420	78	87	483	10.7	909	10.4	1	1
10.79	1401	759	642	298	224	228	327	220	426	78	87	483	10.7	922	10.6	1	1
11.02	1424	769	655	299	225	232	334	219	425	70	80	483	10.7	958	11.1	2	1
11.25	1436	772	664	302	230	233	346	227	425	73	82	512	11.1	981	11.7	2	2
11.56	1456	782	674	308	233	235	365	232	432	86	91	617	12.3	981	11.7	2	2
11.77	1473	793	680	312	237	238	376	225	438	78	82	641	12.6	992	12.2	3	3

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NO.45 NORMAL FEMALE SOMATOTYPE:6.0,2.0,3.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
12.02	1496	803	693	316	241	241	399	235	455	78	85	641	12.6	999	13.0	3	3
12.29	1517	814	703	323	243	242	422	242	458	84	85	641	12.6	999	13.0	3	3
12.56	1534	825	709	328	249	244	432	247	473	92	85	648	12.7	999	13.0	3	3
12.77	1549	830	719	329	252	244	435	240	471	90	93	692	13.2	999	13.0	4	4
13.03	1559	840	719	336	255	245	470	247	487	88	90	***	****	***	****	4	4
13.26	1567	851	716	338	259	245	498	255	503	100	94	***	****	***	****	5	5
13.57	1583	855	728	342	260	249	510	265	514	98	102	***	****	***	****	5	5
13.78	1591	860	731	342	260	247	520	265	510	104	100	***	****	***	****	5	5
14.03	1595	868	727	345	263	248	553	271	538	132	111	***	****	***	****	5	5
14.30	1601	877	724	347	267	248	573	280	550	170	127	***	****	***	****	5	5
14.57	1605	879	726	341	266	246	576	281	562	160	125	***	****	***	****	5	5
14.78	1604	879	725	343	267	250	563	276	551	132	120	***	****	***	****	5	5
15.03	1606	886	720	349	272	249	580	274	568	144	127	***	****	***	****	5	5
16.02	1622	890	732	355	270	247	610	292	574	172	158	***	****	***	****	5	5
17.06	1621	897	724	355	279	247	618	290	579	190	160	***	****	***	****	5	5
18.05	1615	897	718	357	276	247	643	299	599	210	165	***	****	***	****	5	5
19.38	1625	893	732	354	275	247	612	288	577	146	152	***	****	***	****	5	5

NO.46 NORMAL FEMALE SOMATOTYPE:6.0,2.0,2.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
7.06	1131	632	499	240	183	174	186	***	***	***	***	329	7.7	498	6.3	1	1
7.50	1149	646	503	244	187	179	200	***	***	***	***	335	7.9	498	6.3	1	1
8.04	1178	656	522	252	192	184	206	***	***	***	***	345	8.2	603	7.5	1	1
8.50	1207	670	537	256	198	188	222	***	***	***	***	353	8.4	652	8.0	1	1
9.04	1242	682	560	264	200	194	231	***	***	52	76	364	8.7	729	8.7	1	1
9.50	1270	687	583	267	206	200	245	***	***	50	91	386	9.2	817	9.5	1	1
10.06	1294	699	595	273	210	203	250	***	***	46	77	485	10.7	854	9.8	1	1
10.51	1321	709	612	279	211	210	254	190	377	48	75	508	11.1	893	10.2	1	1
11.05	1353	734	619	286	217	211	281	198	397	56	85	521	11.2	963	11.2	1	1
11.51	1381	743	638	290	223	217	288	200	391	56	83	563	11.8	976	11.5	1	1
12.05	1415	758	657	298	228	223	313	200	415	62	80	634	12.6	992	12.2	2	2
12.30	1432	775	657	301	232	225	325	207	427	62	80	648	12.7	992	12.2	3	2
12.51	1444	775	669	306	236	225	331	204	418	60	82	692	13.2	992	12.2	3	3
12.79	1465	784	681	312	241	229	359	208	435	65	84	692	13.2	992	12.2	4	4
13.05	1482	796	686	315	241	234	368	208	441	67	74	692	13.2	999	13.0	4	4
13.30	1505	812	693	321	246	233	400	220	463	77	86	692	13.2	999	13.0	4	4
13.50	1511	816	695	322	246	234	404	224	468	74	82	701	13.3	999	13.0	4	4
13.79	1526	825	701	330	254	233	430	230	483	86	97	701	13.3	999	13.0	4	5
14.04	1530	839	691	332	255	236	465	240	507	113	117	***	****	***	****	4	5
14.29	1538	841	697	337	261	238	484	246	515	125	113	771	13.9	999	13.0	4	5
14.67	1556	847	709	341	266	237	501	258	532	106	140	822	14.4	999	13.0	5	5
15.04	1556	853	703	346	270	238	529	262	541	124	138	923	15.1	999	13.0	5	5
15.52	1564	869	695	348	278	238	550	280	567	180	160	996	15.8	999	13.0	5	5
16.06	1563	869	694	354	282	237	585	292	575	170	175	999	16.0	999	13.0	5	5
16.99	1566	873	693	356	298	237	657	304	610	280	200	999	16.0	999	13.0	5	5

NO.47 NORMAL FEMALE SOMATOTYPE:5.0,2.5,2.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
3.53	912	541	371	203	***	***	141	***	***	***	***	203	3.5	383	4.9	1	1
4.01	949	546	403	215	160	***	152	***	***	***	***	203	3.5	424	5.4	1	1
4.52	984	561	423	217	164	***	156	***	***	***	***	207	3.6	477	6.0	1	1
5.02	1019	585	434	226	167	***	168	***	***	***	***	237	4.5	477	6.0	1	1
5.56	1041	601	440	229	170	159	163	***	***	***	***	241	4.7	544	6.8	1	1
6.00	1063	606	457	234	175	162	172	***	***	***	***	258	5.3	568	7.1	1	1
6.59	1094	615	479	241	181	163	186	***	***	***	***	263	5.5	609	7.5	1	1
7.00	1125	634	491	244	182	171	190	***	***	***	***	269	5.7	676	8.3	1	1
7.55	1156	647	509	253	188	176	211	***	***	44	70	290	6.4	706	8.5	1	1
7.99	1185	654	531	256	193	178	218	***	***	41	68	341	8.1	760	9.0	1	1
8.55	1210	670	540	260	195	185	231	***	***	47	81	350	8.3	839	9.7	1	1
9.01	1241	684	557	270	200	189	250	192	386	54	89	361	8.6	839	9.7	1	1
9.55	1270	694	576	278	207	192	270	192	388	52	84	369	8.8	879	10.1	1	1
10.06	1298	716	582	281	213	196	277	197	390	57	82	430	9.9	916	10.5	1	1
10.54	1321	721	600	287	216	202	288	198	403	61	86	449	10.2	916	10.5	1	1
10.98	1342	724	618	287	220	204	300	199	412	54	82	483	10.7	931	10.7	1	1
11.54	1374	731	643	295	224	211	335	212	438	70	124	483	10.7	968	11.3	2	1
11.73	1387	745	642	295	227	212	335	213	432	64	110	483	10.7	981	11.7	2	1
12.00	1408	749	659	300	230	213	344	210	437	62	95	529	11.3	992	12.2	2	2
12.27	1423	749	674	304	234	215	350	215	444	64	103	594	12.1	992	12.2	3	3
12.54	1430	758	672	310	236	217	376	222	447	80	113	641	12.6	992	12.2	3	3
12.76	1458	779	679	310	241	218	383	220	462	72	107	641	12.6	999	13.0	3	3
13.00	1478	788	690	311	244	220	388	220	447	68	100	692	13.2	***	****	3	4
13.26	1493	796	697	320	251	220	415	228	471	83	123	692	13.2	999	13.0	4	4
13.53	1512	806	706	324	255	224	445	234	484	91	124	692	13.2	999	13.0	4	4
13.74	1528	816	712	330	261	224	457	233	494	89	135	692	13.2	999	13.0	4	4
14.01	1539	825	714	335	262	227	479	247	510	90	140	701	13.3	999	13.0	4	5
14.26	1551	829	722	341	267	227	507	250	520	100	160	709	13.3	999	13.0	4	5
14.53	1557	834	723	342	269	227	529	257	543	103	165	724	13.5	999	13.0	5	5
14.76	1562	841	721	343	269	230	530	264	552	130	168	752	13.7	999	13.0	5	5
15.01	1568	843	725	344	272	229	523	261	530	105	165	789	14.1	999	13.0	5	5
16.06	1575	853	722	347	278	226	532	265	545	105	178	991	15.7	999	13.0	5	5
17.00	1586	860	726	349	278	227	543	265	538	146	184	996	15.8	999	13.0	5	5
18.00	1587	865	722	358	288	227	604	298	590	346	208	999	16.0	999	13.0	5	5
18.97	1586	859	727	352	285	227	586	292	565	125	250	999	16.0	999	13.0	5	5
20.26	1588	867	721	351	286	226	568	283	560	133	198	***	****	***	****	5	5

NO.48 NORMAL FEMALE SOMATOTYPE:5.0,3.0,2.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
5.05	1011	577	434	222	***	***	147	***	***	***	***	258	5.3	404	5.2	1	1
5.53	1037	594	443	226	165	***	154	***	***	***	***	269	5.7	426	5.4	1	1
6.04	1057	605	452	234	167	***	159	***	***	***	***	276	6.0	497	6.3	1	1
6.54	1083	611	472	236	172	***	156	***	***	***	***	276	6.0	516	6.5	1	1

CONTINUED—

NO.48 NORMAL FEMALE SOMATOTYPE:5.0,3.0,2.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
7.08	1102	619	483	242	177	167	161	***	***	***	***	300	6.8	584	7.3	1	1
7.52	1133	636	497	250	180	170	170	***	***	***	***	300	6.8	608	7.5	1	1
8.11	1164	643	521	255	186	175	188	***	***	***	***	334	7.8	652	8.1	1	1
8.52	1183	650	533	261	188	180	188	***	***	***	***	334	7.8	652	8.1	1	1
9.07	1204	664	540	268	194	182	206	***	***	43	67	363	8.6	734	8.7	1	1
9.51	1227	675	552	269	196	186	218	***	***	45	76	371	8.8	734	8.7	1	1
10.07	1248	683	565	279	202	189	229	***	***	49	75	390	9.3	788	9.2	1	1
10.53	1280	699	581	284	207	193	240	185	378	50	83	406	9.6	826	9.6	1	1
11.07	1307	710	597	290	210	196	257	190	385	53	82	443	10.1	872	10.0	1	1
11.58	1332	723	609	294	216	207	261	190	382	50	83	483	10.7	888	10.2	1	1
12.06	1351	726	625	297	222	207	272	184	380	50	85	493	10.8	909	10.4	2	1
12.50	1377	735	642	301	226	209	281	187	395	49	79	515	11.1	909	10.4	2	1
13.06	1426	766	660	306	238	216	361	221	457	96	138	604	12.2	981	11.7	2	1
13.25	1434	773	661	309	239	217	343	209	433	64	100	642	12.6	989	12.0	3	1
13.52	1456	779	677	313	241	222	350	209	428	65	100	651	12.7	989	12.0	3	2
13.79	1473	790	683	319	245	223	365	211	438	65	97	674	13.0	989	12.0	3	3
14.06	1502	808	694	324	251	222	388	213	439	73	97	674	13.0	999	13.0	3	3
14.28	1513	814	699	325	252	224	402	216	466	75	108	692	13.2	999	13.0	3	4
14.52	1528	820	708	332	255	225	404	218	456	72	110	***	****	***	****	3	4
14.78	1540	829	711	340	262	227	418	222	467	80	113	714	13.4	999	13.0	3	4
15.05	1554	834	720	341	264	226	437	226	473	73	107	728	13.5	999	13.0	3	4
15.53	1566	845	721	342	271	227	476	242	511	93	140	814	14.3	999	13.0	4	5
16.05	1579	856	723	358	275	226	500	252	524	90	162	909	15.1	999	13.0	4	5
17.05	1586	869	717	359	284	227	534	264	546	98	170	991	15.7	999	13.0	5	5
17.58	1587	863	724	361	283	226	510	258	527	93	152	991	15.7	999	13.0	5	5
18.06	1587	861	726	361	281	226	498	249	518	76	135	996	15.8	999	13.0	5	5
19.12	1590	868	722	364	284	228	491	250	509	80	140	999	16.0	999	13.0	5	5

NO.49 NORMAL FEMALE SOMATOTYPE:5.0,2.5,2.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
5.97	1088	625	463	236	180	160	181	***	***	***	***	258	5.3	363	4.7	1	1
6.47	1114	637	477	242	183	164	188	***	***	***	***	258	5.3	378	4.9	1	1
6.96	1148	650	498	253	188	174	204	***	***	61	96	276	5.9	489	6.2	1	1
7.44	1170	661	509	255	190	172	209	***	***	52	106	311	7.1	509	6.4	1	1
8.04	1202	674	528	261	192	179	229	***	***	54	113	321	7.4	533	6.6	1	1
8.48	1230	679	551	266	201	183	234	172	382	61	100	335	7.9	585	7.3	1	1
8.98	1258	691	567	271	203	187	247	178	392	65	96	364	8.7	***	****	1	1
9.47	1281	710	571	275	207	191	259	183	398	67	105	371	8.9	717	8.6	1	1
9.95	1305	718	587	279	213	195	275	185	420	71	110	382	9.1	794	9.3	1	1
10.49	1336	728	608	286	218	197	295	190	436	75	128	443	10.1	834	9.6	1	1
10.97	1357	733	624	289	219	202	298	190	430	73	130	472	10.6	886	10.1	1	1
11.47	1381	744	637	293	224	208	316	196	445	73	121	482	10.7	909	10.4	2	1
11.76	1405	751	654	298	226	208	327	195	442	68	112	569	11.8	952	11.0	2	1
11.97	1418	766	652	301	229	209	335	195	442	71	120	583	12.0	981	11.7	3	1
12.21	1442	771	671	304	234	210	344	195	444	70	103	634	12.6	999	13.0	3	2
12.46	1464	781	683	311	236	216	354	193	443	64	102	648	12.7	999	13.0	3	3
12.77	1488	799	689	316	244	216	375	197	460	74	120	692	13.2	999	13.0	3	3
12.96	1501	802	699	320	246	219	392	201	462	86	105	692	13.2	999	13.0	3	3
13.21	1515	813	702	324	252	218	408	210	479	101	135	692	13.2	999	13.0	4	4
13.48	1527	819	708	324	252	218	416	213	486	98	120	692	13.2	999	13.0	5	4
13.77	1540	822	718	331	255	219	435	224	499	110	145	719	13.4	999	13.0	5	4
13.98	1545	831	714	333	260	219	452	221	512	134	134	719	13.4	999	13.0	5	5
14.23	1547	831	716	333	259	220	456	225	506	126	145	772	13.9	999	13.0	5	5
14.46	1555	837	718	334	257	220	449	222	509	110	160	794	14.1	999	13.0	5	5
14.76	1562	839	723	336	262	220	472	231	537	133	190	804	14.2	999	13.0	5	5
14.98	1560	842	718	336	260	220	469	232	525	125	175	845	14.6	999	13.0	5	5
15.46	1564	849	715	341	269	220	483	239	536	145	175	929	15.2	999	13.0	5	5
15.97	1564	853	711	340	275	221	508	245	558	152	214	996	15.8	999	13.0	5	5
16.97	1566	854	712	345	279	221	540	263	574	174	206	999	16.0	999	13.0	5	5
18.96	1569	847	722	342	275	220	495	242	535	168	180	999	16.0	999	13.0	5	5

NO.50 NORMAL FEMALE SOMATOTYPE:5.0,3.0,3.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
4.01	1056	608	448	238	***	***	213	***	***	***	***	***	****	***	****	1	1
4.51	1086	608	478	251	***	***	225	***	***	***	***	283	6.2	475	6.0	1	1
5.01	1117	636	481	258	188	***	234	***	***	***	***	302	6.8	493	6.2	1	1
5.50	1153	654	499	266	193	***	254	***	***	***	***	302	6.8	545	6.8	1	1
6.00	1185	669	516	266	191	***	245	***	***	***	***	319	7.4	580	7.2	1	1
6.60	1211	672	539	278	197	202	277	***	***	***	***	319	7.4	652	8.0	1	1
7.02	1255	691	564	282	201	208	284	***	***	***	***	333	7.8	696	8.4	1	1
7.50	1283	709	574	289	206	211	290	***	***	***	***	351	8.3	733	8.7	1	1
8.01	1316	719	597	295	211	216	315	***	***	83	113	390	9.3	832	9.6	1	1
8.50	1341	725	616	300	218	220	331	***	***	90	146	427	9.9	875	10.0	1	1
9.01	1372	735	637	305	220	225	343	***	***	84	121	447	10.2	914	10.5	1	1
9.49	1397	751	646	313	226	230	367	221	470	100	132	483	10.7	936	10.7	1	1
10.01	1422	762	660	316	230	234	379	233	466	101	123	541	11.5	***	****	1	2
10.51	1454	771	683	323	232	238	400	236	482	105	142	598	12.1	981	11.7	1	3
11.01	1489	785	704	327	235	245	402	227	470	95	134	675	13.0	981	11.7	1	3
11.29	1500	793	707	334	237	246	424	232	487	105	127	675	13.0	999	13.0	2	4
11.51	1508	794	714	338	243	249	431	235	486	104	135	675	13.0	999	13.0	2	4
11.74	1533	808	725	341	244	253	440	238	492	105	125	685	13.1	999	13.0	3	4
12.02	1546	812	734	346	245	252	465	244	508	112	126	692	13.2	999	13.0	3	4
12.29	1563	826	737	346	249	255	483	245	515	106	140	692	13.2	999	13.0	3	4
12.48	1582	834	748	350	252	257	492	243	517	111	120	692	13.2	999	13.0	3	4
13.02	1605	839	766	355	260	258	531	253	533	122	134	692	13.2	999	13.0	4	4
13.29	1624	854	770	366	265	262	544	250	534	101	142	695	13.2	999	13.0	4	5
13.51	1628	857	771	369	265	260	553	248	549	98	130	699	13.2	999	13.0	4	5
14.01	1656	868	788	378	270	265	573	256	554	98	142	818	14.4	999	13.0	4	5
14.49	1667	871	796	379	275	264	592	257	560	100	142	853	14.7	999	13.0	4	5
15.01	1672	884	788	386	278	262	600	262	566	117	155	991	15.7	999	13.0	5	5
16.01	1678	884	794	390	281	262	612	278	565	125	185	999	16.0	999	13.0	5	5
17.10	1681	888	793	394	286	263	633	283	570	132	192	999	16.0	999	13.0	5	5
18.02	1683	890	793	396	291	264	663	298	589	184	210	999	16.0	999	13.0	5	5

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
NO.51 NORMAL FEMALE SOMATOTYPE:4.5,3.0,3.0																	
4.98	1112	626	486	244	***	***	186	***	***	***	***	***	****	***	****	1	1
5.48	1151	636	515	248	***	***	206	***	***	***	***	***	****	***	****	1	1
5.98	1182	651	531	256	***	***	215	***	***	***	***	***	****	***	****	1	1
6.48	1208	668	540	261	***	***	215	***	***	***	***	***	****	***	****	1	1
6.99	1243	680	563	267	182	***	229	***	***	***	***	333	7.8	748	8.9	1	1
7.49	1270	688	582	268	186	***	234	***	***	***	***	350	8.3	788	9.2	1	1
7.99	1294	697	597	278	192	***	250	***	***	***	***	367	8.8	788	9.2	1	1
8.49	1318	706	612	281	196	209	259	***	***	***	***	375	8.9	864	9.9	1	1
8.98	1343	711	632	287	200	212	277	***	***	***	***	418	9.7	864	9.9	1	1
9.46	1369	721	648	293	202	217	293	***	***	***	***	463	10.4	909	10.4	1	1
9.98	1404	739	665	305	211	224	308	***	***	60	64	472	10.6	943	10.8	1	1
10.48	1459	755	704	308	217	230	340	***	***	62	95	493	10.9	965	11.3	2	1
10.69	1470	769	701	310	219	231	345	***	***	65	82	515	11.2	965	11.3	2	1
10.98	1485	785	700	314	225	236	370	***	***	73	80	589	12.0	981	11.7	3	2
11.25	1508	787	721	318	226	239	374	***	***	63	74	656	12.8	992	12.2	3	3
11.47	1527	794	733	326	230	238	397	216	462	73	74	670	12.9	999	13.0	4	3
11.70	1547	807	740	326	232	242	404	221	465	74	77	677	13.0	999	13.0	4	4
11.99	1564	825	739	331	238	242	438	228	480	84	91	692	13.2	999	13.0	4	4
12.24	1577	823	754	335	235	244	443	225	492	80	77	692	13.2	999	13.0	4	4
12.47	1587	829	758	338	239	246	454	229	488	84	87	695	13.2	999	13.0	4	4
12.70	1596	836	760	340	240	247	463	232	508	92	92	725	13.5	999	13.0	4	4
12.99	1602	847	755	342	242	247	474	234	507	88	97	752	13.7	999	13.0	4	5
13.24	1606	849	757	345	247	249	465	237	508	85	93	767	13.9	999	13.0	5	5
13.49	1612	848	764	346	246	249	495	240	528	96	103	794	14.1	999	13.0	5	5
13.70	1617	850	767	347	248	250	493	247	523	104	104	813	14.3	999	13.0	5	5
13.99	1622	857	765	350	249	250	508	249	541	110	115	832	14.5	999	13.0	5	5
14.49	1628	859	769	350	250	249	530	252	542	105	117	872	14.8	999	13.0	5	5
14.99	1630	867	763	351	255	244	553	256	565	123	138	996	15.8	999	13.0	5	5
15.48	1631	864	767	355	257	248	535	258	552	118	123	999	16.0	999	13.0	5	5
15.98	1634	864	770	359	264	250	569	265	573	130	165	999	16.0	999	13.0	5	5
16.98	1641	867	774	361	263	250	555	263	561	138	134	999	16.0	999	13.0	5	5
19.07	1632	868	764	367	269	248	620	290	588	180	175	999	16.0	999	13.0	5	5
22.98	1631	859	772	364	266	251	611	288	578	190	140	***	****	***	****	5	5
NO.52 NORMAL FEMALE SOMATOTYPE:4.5,3.0,4.0																	
3.52	1004	577	427	230	152	159	159	***	***	46	88	219	4.0	282	3.8	1	1
3.96	1052	585	467	239	157	160	170	***	***	44	87	225	4.1	318	4.2	1	1
4.52	1094	626	468	247	161	172	184	***	***	48	82	242	4.7	412	5.3	1	1
4.98	1130	633	497	254	163	175	204	174	364	48	93	277	6.0	488	6.2	1	1
5.52	1170	647	523	254	170	178	202	174	354	48	85	310	7.1	504	6.3	1	1
5.97	1208	672	536	265	171	185	207	172	356	41	63	322	7.4	573	7.2	1	1
6.51	1241	694	547	275	177	190	238	178	376	57	75	327	7.6	604	7.5	1	1
6.95	1262	695	567	277	182	197	238	180	379	48	86	335	7.9	705	8.5	1	1
7.51	1300	708	592	281	184	201	254	181	385	53	70	370	8.8	817	9.5	1	1
7.97	1329	711	618	288	188	206	258	185	385	46	60	403	9.5	832	9.6	1	1
8.51	1356	729	627	292	195	209	273	189	386	56	76	427	9.9	855	9.8	1	2
8.97	1383	742	641	297	198	216	285	195	401	54	73	475	10.6	920	10.6	1	2
9.50	1417	762	655	310	208	217	317	208	422	59	84	493	10.9	952	11.0	1	3
9.98	1450	766	684	316	213	222	333	212	437	56	84	519	11.2	968	11.3	1	3
10.50	1484	777	707	322	213	225	329	198	410	49	63	596	12.1	981	11.7	2	4
10.73	1498	782	716	324	216	229	344	202	418	53	65	651	12.7	992	12.2	3	4
10.98	1514	793	721	330	218	230	355	204	434	55	64	651	12.7	999	13.0	4	4
11.23	1536	810	726	337	220	234	386	213	444	62	74	661	12.9	999	13.0	4	4
11.51	1549	815	734	339	223	232	380	208	445	61	68	661	12.9	999	13.0	4	4
11.73	1553	819	734	340	223	233	380	207	441	57	65	678	13.0	999	13.0	4	5
12.01	1569	832	737	344	225	234	396	209	444	58	63	678	13.0	999	13.0	4	5
12.24	1584	842	742	346	226	234	419	217	458	57	76	695	13.2	999	13.0	4	5
12.51	1586	850	736	352	231	235	438	223	480	61	84	709	13.3	999	13.0	4	5
12.70	1591	850	741	353	231	235	448	229	499	74	91	729	13.5	999	13.0	4	5
12.97	1597	855	742	353	232	235	464	234	508	73	97	736	13.6	999	13.0	4	5
13.51	1602	863	739	360	234	236	478	243	528	94	118	794	14.1	999	13.0	4	5
13.97	1609	870	739	364	240	238	512	258	547	104	130	823	14.4	999	13.0	4	5
14.50	1609	871	738	363	242	238	524	262	557	110	152	865	14.7	999	13.0	5	5
17.01	1612	872	740	366	242	237	549	278	565	147	160	***	****	***	****	5	5
NO.53 NORMAL FEMALE SOMATOTYPE:4.5,2.5,4.0																	
3.52	1025	586	439	231	161	***	175	***	***	***	***	264	5.5	241	3.3	1	1
4.00	1058	611	447	245	163	***	190	***	***	***	***	264	5.5	263	3.6	1	1
4.52	1102	612	490	250	165	***	197	***	***	***	***	301	6.8	310	4.1	1	1
5.10	1128	638	490	253	173	172	218	***	***	***	***	315	7.2	367	4.7	1	1
5.52	1155	645	510	260	176	174	220	***	***	***	***	315	7.2	421	5.4	1	1
6.02	1192	660	532	266	179	181	229	***	***	***	***	318	7.3	446	5.7	1	1
6.51	1229	676	553	271	185	190	240	***	***	52	82	339	8.0	482	6.1	1	1
7.00	1258	675	583	276	186	191	252	***	***	49	84	339	8.0	500	6.3	1	1
7.51	1284	684	600	284	190	196	263	***	***	52	93	346	8.2	567	7.1	1	1
8.03	1315	706	609	288	193	201	279	198	400	51	88	383	9.1	634	7.9	1	1
8.53	1344	713	631	294	198	203	293	199	407	46	92	393	9.3	***	****	1	1
9.03	1364	721	643	299	201	214	306	200	408	53	83	430	9.9	786	9.2	1	1
9.50	1402	735	667	304	205	215	316	200	415	49	77	447	10.2	786	9.2	1	1
10.04	1432	740	692	313	210	223	336	205	436	57	94	472	10.6	855	9.8	2	1
10.52	1459	751	708	316	215	225	354	208	435	60	101	482	10.7	916	10.5	2	1
11.02	1508	772	736	325	221	230	396	223	461	62	84	482	10.7	968	11.3	2	1
11.31	1530	790	740	331	225	236	411	222	458	67	88	571	11.9	987	11.9	2	1
11.52	1540	801	739	335	227	240	413	220	465	57	95	645	12.7	999	13.0	3	2
11.77	1561	809	752	341	232	239	448	225	480	63	94	673	13.0	999	13.0	3	2
12.01	1583	814	769	345	234	243	447	228	477	61	90	685	13.1	999	13.0	3	3
12.32	1607	827	780	353	241	243	473	232	483	63	98	688	13.1	999	13.0	4	3
12.51	1615	830	785	358	243	245	489	234	493	68	88	712	13.4	999	13.0	4	3
12.76	1631	835	796	359	246	246	487	231	494	68	86	712	13.4	999	13.0	4	3
13.03	1636	844	792	363	248	248	511	244	520	72	90	715	13.4	999	13.0	4	4
13.32	1653	856	797	364	248	246	522	247	520	72	101	729	13.5	999	13.0	4	4
13.53	1657	857	800	367	252	249	534	239	515	65	103	741	13.6	999	13.0	4	4
13.78	1663	862	801	368	251	250	550	245	529	78	120	849	14.6	999	13.0	4	4
14.10	1666	865	801	368	252	250	541	245	535	67	101	886	14.9	999	13.0	4	4
14.32	1667	871	796	370	253	252	564	254	546	82	127	909	15.1	999	13.0	4	4
14.53	1667	869	798	372	254	252	545	246	535	70	113	933	15.2	999	13.0	4	4

CONTINUED—

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
NO.53 NORMAL FEMALE SOMATOTYPE:4.5,2.5,4.0																	
14.78	1671	873	798	374	253	251	548	244	540	73	116	938	15.2	999	13.0	4	4
15.14	1671	868	803	374	253	252	532	237	524	62	92	938	15.2	999	13.0	4	5
16.02	1682	881	801	375	256	253	543	242	529	72	110	***	****	***	****	5	5
17.01	1671	875	796	379	261	250	538	243	536	71	113	999	16.0	999	13.0	5	5
17.99	1686	874	812	376	258	249	524	239	518	65	97	999	16.0	999	13.0	5	5
19.03	1674	878	796	379	260	249	543	249	535	73	102	***	****	***	****	5	5
25.03	1678	881	797	382	265	246	604	275	560	91	136	***	****	***	****	5	5
NO.54 NORMAL FEMALE SOMATOTYPE:5.0,3.0,4.0																	
7.05	1274	692	582	278	189	205	247	***	***	***	***	337	7.9	559	7.0	1	1
7.47	1308	697	611	280	193	207	245	***	***	***	***	353	8.4	653	8.1	1	1
7.96	1329	708	621	284	195	208	259	***	***	***	***	353	8.4	682	8.3	1	1
8.47	1361	722	639	292	199	215	272	***	***	55	64	374	8.9	747	8.9	1	1
8.95	1387	731	656	298	204	221	293	***	***	55	80	410	9.6	807	9.4	1	1
9.47	1418	743	675	302	206	229	302	***	***	56	68	427	9.9	848	9.8	1	1
9.95	1445	757	688	305	208	232	318	188	397	58	67	475	10.6	870	10.0	1	1
10.46	1475	765	710	312	212	238	338	199	423	61	93	538	11.5	913	10.5	1	1
10.96	1499	773	726	315	217	240	352	202	420	64	92	538	11.5	929	10.7	1	1
11.46	1525	785	740	323	222	249	372	208	433	73	96	592	12.1	960	11.2	1	1
11.96	1561	790	771	332	229	250	402	211	461	69	102	675	13.0	973	11.5	1	1
12.48	1605	824	781	341	234	260	424	211	446	65	78	685	13.1	999	13.0	2	1
12.75	1628	832	796	342	239	262	469	222	482	91	100	685	13.1	999	13.0	2	1
12.94	1642	836	806	346	241	261	467	224	468	80	90	692	13.2	999	13.0	3	2
13.21	1661	846	815	354	246	262	498	226	490	89	93	699	13.2	999	13.0	3	3
13.47	1673	855	818	358	246	264	500	225	493	86	90	730	13.5	999	13.0	3	4
13.75	1684	871	813	363	250	264	514	228	491	94	117	778	14.0	999	13.0	3	4
13.97	1695	874	821	368	253	265	535	238	508	94	117	846	14.6	999	13.0	3	4
14.20	1703	876	827	368	255	264	527	230	507	94	102	936	15.2	999	13.0	3	4
14.47	1707	882	825	371	259	264	540	235	510	100	121	968	15.5	999	13.0	3	4
14.74	1716	886	830	374	259	265	557	242	514	117	144	991	15.7	999	13.0	4	4
14.95	1717	885	832	374	260	266	566	237	517	105	124	991	15.7	999	13.0	5	4
15.47	1722	892	830	377	264	264	566	240	520	117	121	999	16.0	999	13.0	5	4
15.74	1725	897	828	377	263	265	568	243	533	103	120	999	16.0	999	13.0	5	5
15.97	1724	898	826	377	263	267	569	239	530	110	112	999	16.0	999	13.0	5	5
16.96	1726	901	825	379	265	265	578	249	536	116	120	999	16.0	999	13.0	5	5
17.94	1726	897	829	379	267	267	568	240	536	105	124	999	16.0	999	13.0	5	5
18.96	1725	900	825	382	273	267	616	264	569	152	165	999	16.0	999	13.0	5	5
19.95	1725	902	823	379	273	267	631	275	568	162	210	999	16.0	999	13.0	5	5
NO.61 NORMAL FEMALE SOMATOTYPE:5.5,2.5,2.5																	
5.02	1100	635	465	230	173	173	201	195	356	77	104	303	6.9	469	6.0	1	1
5.57	1138	648	490	247	180	180	211	194	360	71	90	***	****	***	****	1	1
6.02	1165	658	507	253	182	184	215	192	359	67	86	315	7.3	532	6.6	1	1
6.57	1195	675	520	258	186	187	224	198	374	81	94	327	7.6	573	7.2	1	1
7.03	1216	685	531	263	189	191	232	195	377	75	90	327	7.6	598	7.4	1	1
7.57	1247	701	546	271	195	195	254	204	384	69	96	327	7.6	712	8.6	1	1
8.03	1275	710	565	275	198	199	263	201	388	72	103	358	8.5	736	8.7	1	1
8.59	1294	715	579	280	201	204	278	209	404	76	94	358	8.5	776	9.1	1	1
9.03	1321	731	590	286	204	210	286	210	412	71	93	410	9.6	796	9.3	1	1
9.56	1345	732	613	288	209	213	299	214	411	71	88	424	9.8	855	9.8	1	1
9.77	1352	745	607	292	210	214	304	216	416	72	93	463	10.4	877	10.0	1	1
10.02	1370	750	620	299	213	218	317	214	439	74	101	463	10.4	877	10.0	1	1
10.27	1381	748	633	299	217	221	314	214	418	60	90	463	10.4	877	10.0	1	1
10.56	1396	756	640	300	218	222	335	225	434	80	102	483	10.7	893	10.2	1	1
10.79	1407	760	647	302	220	224	340	224	444	71	91	529	11.3	909	10.4	1	1
11.02	1424	773	651	305	223	228	347	222	446	77	101	529	11.3	931	10.7	1	1
11.25	1431	774	657	307	225	230	359	227	462	77	103	557	11.7	931	10.7	2	1
11.56	1448	787	661	312	230	231	376	238	459	90	102	590	12.1	968	11.3	2	1
11.77	1465	791	674	315	233	236	382	228	457	77	93	602	12.2	992	12.2	2	1
12.02	1489	807	682	319	239	237	417	238	485	86	92	666	12.9	999	13.0	3	2
12.29	1517	823	694	327	243	239	432	239	488	91	89	685	13.1	999	13.0	3	3
12.56	1537	830	707	332	246	242	454	248	497	92	94	692	13.2	999	13.0	3	3
12.77	1551	842	709	334	250	244	467	244	498	85	100	692	13.2	999	13.0	3	3
13.03	1573	851	722	337	253	244	482	243	510	95	98	***	****	***	****	3	3
13.26	1582	861	721	338	254	245	505	247	517	95	103	***	****	***	****	4	4
13.57	1591	866	725	345	259	245	530	264	535	108	102	***	****	***	****	5	5
13.78	1599	872	727	346	260	245	540	261	537	104	105	***	****	***	****	5	5
14.03	1599	879	720	346	264	246	567	263	559	125	121	***	****	***	****	5	5
14.30	1613	888	725	349	266	247	593	272	576	160	137	***	****	***	****	5	5
14.57	1621	892	729	351	267	245	603	275	579	170	152	***	****	***	****	5	5
14.78	1623	891	732	352	271	246	608	273	576	152	134	***	****	***	****	5	5
15.03	1626	895	731	351	271	246	613	279	582	182	140	***	****	***	****	5	5
16.02	1637	901	736	355	295	246	668	272	615	235	182	***	****	***	****	5	5
17.06	1642	913	729	356	278	244	658	289	609	210	177	***	****	***	****	5	5
18.07	1646	907	739	354	273	246	596	266	566	124	127	***	****	***	****	5	5
19.64	1644	910	734	353	275	244	629	285	588	150	167	***	****	***	****	5	5
NO:62 BIRTH WT:2013 AGE AT MENARCHE:13.3																	
8.61	1315	695	620	288	218	***	257	***	***	***	***	***	****	***	****	1	1
9.61	1365	706	659	297	229	***	293	193	***	***	***	***	****	***	****	1	1
10.10	1402	733	669	306	226	***	302	194	***	***	***	***	****	***	****	1	1
10.69	1428	742	686	312	238	***	333	199	***	***	***	***	****	***	****	1	1
11.62	1483	763	720	312	236	***	365	210	***	44	94	***	****	***	****	1	1
11.12	1458	750	708	310	240	***	349	209	***	***	***	***	****	***	****	1	1
12.18	1524	793	731	328	245	***	388	214	***	50	90	***	****	***	****	1	1
12.53	1546	784	762	332	250	***	406	216	***	54	84	***	****	***	****	1	1
13.07	1600	832	768	338	261	***	443	218	***	79	85	***	****	***	****	4	4
13.45	1626	832	794	346	273	***	479	225	492	72	90	***	****	***	****	4	4
14.03	1656	860	796	358	274	***	491	232	501	73	90	***	****	***	****	4	4
14.53	1663	871	792	363	280	***	502	232	504	70	91	***	****	***	****	4	5
14.97	1668	888	780	366	283	***	539	241	530	90	110	***	****	***	****	5	5
15.51	1673	885	788	367	285	***	562	249	538	113	124	***	****	***	****	5	5
16.02	1677	890	787	368	287	***	567	253	546	120	125	***	****	***	****	5	5
17.04	1677	899	778	371	293	***	598	266	557	130	154	***	****	***	****	5	5
18.01	1680	897	783	373	295	***	593	265	554	144	142	***	****	***	****	5	5
18.99	1684	899	785	375	301	***	634	275	580	140	175	***	****	***	****	5	5

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
NO:63 BIRTH WT:1914 AGE AT MENARCHE:13.5																	
8.61	1271	687	584	278	212	***	240	***	***	***	***	***	****	***	****	1	1
9.61	1321	699	622	285	219	***	274	186	***	***	***	***	****	***	****	1	1
10.10	1350	728	622	289	217	***	285	186	***	***	***	***	****	***	****	1	1
10.69	1382	731	651	295	228	***	320	191	***	***	***	***	****	***	****	1	1
11.12	1413	742	671	300	236	***	338	204	***	***	***	***	****	***	****	1	1
11.62	1433	757	676	304	236	***	357	210	***	46	118	***	****	***	****	1	1
12.18	1479	782	697	320	236	***	379	212	***	52	116	***	****	***	****	1	1
12.53	1502	765	737	322	249	***	405	221	***	66	116	***	****	***	****	1	1
13.07	1554	816	738	325	254	***	439	223	***	82	138	***	****	***	****	3	2
13.45	1585	820	765	330	262	***	467	229	492	75	109	***	****	***	****	3	3
14.03	1626	844	782	343	268	***	486	235	505	74	114	***	****	***	****	4	4
14.53	1632	854	778	350	274	***	526	242	511	84	117	***	****	***	****	4	4
14.97	1638	860	778	354	276	***	529	238	518	85	128	***	****	***	****	5	5
15.51	1644	865	779	351	280	***	566	254	547	108	141	***	****	***	****	5	5
16.02	1649	869	780	354	287	***	579	261	560	118	160	***	****	***	****	5	5
17.04	1653	876	777	358	290	***	603	263	568	114	160	***	****	***	****	5	5
18.01	1655	879	776	363	295	***	627	270	576	135	160	***	****	***	****	5	5
18.99	1653	882	771	364	295	***	600	269	562	91	144	***	****	***	****	5	5
NO:64 BIRTH WT:**** AGE AT MENARCHE:14.8																	
.64	****	***	***	161	128	***	89	172	***	87	147	37	****	160	.7	1	1
1.00	****	***	***	168	131	***	94	178	***	90	115	87	1.1	162	.8	1	1
1.54	****	***	***	183	148	***	118	163	302	86	105	139	1.6	162	.8	1	1
2.02	842	522	320	197	142	***	123	163	318	67	84	174	2.2	162	.8	1	1
2.53	885	542	343	208	150	***	137	172	328	80	93	187	2.8	169	1.4	1	1
3.01	919	556	363	212	155	***	145	173	320	80	104	222	3.1	201	2.6	1	1
3.51	946	569	377	222	160	***	158	180	333	85	98	226	4.1	211	2.9	1	1
3.98	995	589	406	230	168	***	169	183	338	78	100	237	4.2	239	3.3	1	1
4.53	1024	600	424	235	169	***	172	172	340	73	94	283	4.5	264	3.6	1	1
5.03	1052	604	448	239	172	***	177	173	345	66	84	291	6.2	301	4.0	1	1
5.49	1080	625	455	246	174	***	182	170	346	70	87	296	6.4	353	4.6	1	1
5.98	1111	632	479	251	177	***	187	168	343	53	76	316	6.6	425	5.4	1	1
6.48	1138	646	492	256	183	***	199	172	354	63	79	329	7.3	440	5.6	1	1
7.00	1163	659	504	263	186	***	203	172	353	55	82	335	7.7	495	6.3	1	1
7.52	1189	665	524	267	187	***	218	174	368	61	85	351	7.9	532	6.6	1	1
8.08	1211	671	540	273	194	***	219	173	364	52	73	351	8.3	560	7.0	1	1
8.53	1231	684	547	279	195	***	233	180	368	57	70	387	8.3	661	8.2	1	1
9.15	1257	689	568	284	201	***	238	177	371	52	82	387	9.2	256	8.9	1	1
9.52	1272	694	578	289	201	***	251	179	372	55	65	447	9.2	812	9.4	1	1
10.01	1291	703	588	294	205	***	261	183	386	56	77	453	10.2	832	9.6	1	1
10.53	1315	705	610	294	211	***	268	180	397	60	74	472	10.3	870	10.0	1	1
11.01	1332	718	614	300	212	***	276	187	405	53	75	472	10.6	870	10.0	1	1
11.52	1354	725	629	303	216	***	296	191	413	63	75	472	10.6	893	10.2	1	1
12.02	1382	742	640	313	221	***	313	205	436	69	83	483	10.7	913	10.5	1	1
12.54	1407	748	659	316	225	***	328	203	435	70	80	534	11.4	968	11.3	1	1
13.07	1433	762	671	321	229	***	334	203	432	70	78	562	11.8	976	11.5	1	1
13.56	1450	770	680	323	231	***	339	195	425	70	72	641	12.6	976	11.5	2	2
14.04	1495	782	713	331	239	***	365	200	442	70	73	685	13.1	989	12.0	2	2
14.52	1522	806	716	339	248	***	388	204	457	69	70	692	13.2	999	13.0	3	3
15.05	1556	828	728	344	253	***	420	208	473	73	70	692	13.2	999	13.0	4	4
15.55	1573	836	737	349	256	***	448	218	493	82	82	715	13.4	999	13.0	4	4
16.04	1586	846	740	355	260	***	456	216	493	83	94	786	14.0	999	13.0	4	5
16.57	1590	852	738	358	261	***	474	223	506	92	89	842	14.6	999	13.0	5	5
17.04	1599	863	736	354	264	***	517	234	530	112	131	878	14.8	999	13.0	5	5
17.53	1599	865	734	360	267	***	525	243	534	123	136	***	****	***	****	5	5
18.19	1605	868	737	361	269	***	512	238	533	107	120	***	****	***	****	5	5
NO:65 BIRTH WT:**** AGE AT MENARCHE:13.5																	
.64	****	***	***	168	117	***	81	158	***	99	170	***	****	159	.7	1	1
1.00	****	***	***	172	138	***	96	167	***	104	130	35	1.1	162	.8	1	1
1.54	****	***	***	177	134	***	108	163	310	97	138	83	1.6	162	.8	1	1
2.02	838	522	316	199	135	***	115	163	308	75	117	116	1.9	164	1.1	1	1
2.53	884	530	354	200	146	***	127	172	310	67	115	149	2.3	177	1.8	1	1
3.01	906	548	358	214	150	***	136	172	317	63	135	180	2.9	188	2.2	1	1
3.59	937	561	376	220	153	***	147	180	328	73	130	182	2.9	217	2.9	1	1
3.98	984	581	403	225	157	***	155	176	335	80	120	215	3.9	276	3.8	1	1
4.53	1021	591	430	235	163	***	166	178	348	80	125	231	4.3	329	4.3	1	1
5.03	1059	598	461	240	164	***	171	179	352	63	116	271	5.8	336	4.4	1	1
5.49	1083	619	464	250	171	***	179	177	347	60	123	292	6.5	414	5.3	1	1
5.98	1112	632	480	256	174	***	181	168	338	46	102	308	7.0	440	5.6	1	1
6.48	1140	641	499	260	176	***	191	169	342	58	107	313	7.2	531	6.6	1	1
7.00	1168	658	510	263	180	***	194	167	338	48	104	341	8.1	560	7.0	1	1
7.52	1189	662	527	273	183	***	213	175	366	51	100	350	8.3	584	7.3	1	1
8.08	1219	679	540	278	189	***	214	169	365	45	96	350	8.3	661	8.2	1	1
8.53	1234	676	558	280	190	***	224	175	367	49	109	357	8.5	712	8.6	1	1
9.15	1260	684	576	289	196	***	241	179	380	58	116	364	8.7	731	8.7	1	1
9.52	1275	696	579	293	198	***	243	180	385	55	105	393	9.3	812	9.4	1	1
10.01	1298	703	595	299	203	***	255	184	389	55	119	409	9.6	855	9.8	1	1
10.53	1320	710	610	302	206	***	269	183	402	59	118	427	9.9	855	9.8	1	1
11.01	1348	722	626	307	208	***	287	189	409	59	117	463	10.4	877	10.0	1	1
11.52	1375	735	640	314	216	***	313	200	430	68	122	489	10.8	898	10.3	1	1
12.02	1422	757	665	324	224	***	341	202	457	73	122	520	11.2	952	11.0	2	2
12.54	1461	773	688	330	232	***	350	197	445	64	90	658	12.8	968	11.3	3	3
13.07	1504	794	710	340	242	***	392	204	477	80	93	692	13.2	992	12.2	3	4
13.56	1527	805	722	348	250	***	411	208	474	79	88	692	13.2	999	13.0	4	4
14.04	1558	826	732	355	256	***	437	213	495	84	110	733	13.6	999	13.0	4	5
14.52	1569	833	736	356	260	***	458	218	501	86	120	804	14.2	999	13.0	4	5
15.05	1581	848	733	360	263	***	500	229	537	102	160	871	14.8	999	13.0	4	5
15.55	1589	852	737	364	269	***	528	237	556	120	193	999	16.0	999	13.0	4	5
16.04	1594	858	736	369	270	***	516	233	541	117	182	999	16.0	999	13.0	5	5
16.57	1595	857	738	369	271	***	526	240	539	111	184	999	16.0	999	13.0	5	5
17.04	1597	863	734	367	270	***	541	241	555	140	180	999	16.0	999	13.0	5	5
17.53	1595	860	735	369	273	***	544	243	553	125	200	***	****	***	****	5	5
18.07	1598	856	742	368	273	***	528	234	551	135	181	***	****	***	****	5	5
19.30	1595	858	737	373	273	***	559	252	569	155	176	***	****	***	****	5	5

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING

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   NO.66    NORMAL FEMALE   SOMATOTYPE:4.5,2.5,3.0
 7.55 1247 698 549 272 210 190 238 183 362  47  74 313  7.2 599  7.4 1 1
 8.06 1290 708 582 280 216 196 252 182 377  43  67 321  7.4 705  8.5 1 1
 8.54 1314 726 588 286 218 201 266 187 383  45  69 327  7.6 749  8.9 1 1
 9.08 1346 742 604 288 224 204 272 190 384  44  64 338  8.0 779  9.2 1 1
 9.54 1365 752 613 296 225 211 295 195 410  51  76 345  8.2 802  9.4 1 1
10.08 1400 752 648 302 231 215 310 197 405  46  82 388  9.2 802  9.4 1 1
10.54 1420 763 657 305 234 217 329 198 420  53  84 *** **** *** **** 1 1
11.53 1468 777 691 316 244 225 351 207 436  53  73 456 10.3 893 10.2 1 1
12.09 1493 788 705 325 250 228 366 210 442  54  75 477 10.6 952 11.0 2 1
12.30 1511 794 717 326 252 230 372 208 435  51  74 484 10.7 968 11.3 2 1
12.55 1528 807 721 328 255 234 395 212 460  56  88 551 11.6 981 11.7 2 1
12.78 1541 819 722 331 255 235 406 213 464  54  80 564 11.8 981 11.7 2 1
13.09 1577 828 749 336 264 239 420 217 462  52  79 602 12.2 981 11.7 3 2
13.30 1595 841 754 342 267 240 437 213 471  54  70 664 12.9 992 12.2 3 2
13.55 1616 850 766 348 271 243 471 227 482  61  84 664 12.9 992 12.2 3 3
13.78 1633 862 771 352 274 243 493 229 499  68  76 674 13.0 999 13.0 3 4
14.10 1659 879 780 354 279 250 526 232 511  66  93 674 13.0 999 13.0 4 4
14.29 1668 890 778 357 281 248 536 237 527  70  91 692 13.2 999 13.0 4 4
14.54 1680 890 790 363 286 248 569 246 548  75  96 692 13.2 999 13.0 5 5
15.14 1699 902 797 371 290 250 601 260 568  81 121 *** **** *** **** 5 5
15.54 1708 913 795 376 296 250 650 270 590 102 163 789 14.1 999 13.0 5 5
16.07 1717 919 798 376 298 252 651 276 596 100 166 910 15.1 999 13.0 5 5
17.07 1731 928 803 385 302 249 687 290 613 112 194 999 16.0 999 13.0 5 5
18.07 1738 931 807 376 301 248 605 266 565  80 125 999 16.0 999 13.0 5 5
20.08 1742 933 809 372 305 249 614 265 574  76 112 *** **** *** **** 5 5
25.13 1750 943 807 383 309 248 631 271 574  72 174 *** **** *** **** 5 5
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   NO.67    NORMAL FEMALE   SOMATOTYPE:7.0,2.0,2.0
 5.51 1140 653 487 242 195 172 229 203 382  82 108 *** **** *** **** 1 1
 6.01 1177 676 501 252 198 179 234 193 380  61 107 305  6.9 475  6.0 1 1
 6.49 1220 694 526 257 204 189 247 192 387  55  94 305  6.9 499  6.3 1 1
 7.02 1253 704 549 263 208 191 245 187 379  48  87 308  7.0 584  7.3 1 1
 7.50 1280 721 559 270 210 196 270 196 401  56 100 320  7.4 604  7.5 1 1
 8.00 1313 730 583 272 218 202 292 205 417  54  87 325  7.6 657  8.1 1 1
 8.50 1341 748 593 281 221 205 310 208 428  62 108 350  8.3 779  9.2 1 1
 9.00 1368 754 614 290 225 209 327 214 438  66  98 357  8.5 819  9.5 1 1
 9.50 1400 761 639 296 235 215 353 223 458  67 120 *** **** *** **** 1 1
10.01 1428 775 653 300 238 219 371 230 471  78 125 455 10.3 909 10.4 1 1
10.51 1453 786 667 310 244 222 404 242 504  85 144 455 10.3 931 10.7 1 1
10.99 1472 795 677 312 245 227 408 234 497  80 130 483 10.7 952 11.0 1 1
11.51 1507 807 700 316 252 229 431 242 508  86 145 505 11.0 965 11.3 2 1
11.76 1518 813 705 317 254 231 444 239 511  86 134 528 11.3 965 11.3 2 2
11.99 1532 823 709 323 257 236 451 241 516  85 130 551 11.6 973 11.5 2 2
12.32 1562 830 732 327 262 240 480 250 527  96 130 585 12.0 999 13.0 2 2
12.51 1572 833 739 330 265 241 498 251 541  92 132 630 12.5 999 13.0 3 3
12.75 1589 846 743 335 268 242 527 257 545  91 140 685 13.1 999 13.0 3 3
13.00 1605 854 751 342 274 243 545 258 562  90 133 692 13.2 999 13.0 4 4
13.29 1619 863 756 344 277 245 573 267 580 107 155 695 13.2 999 13.0 4 4
13.50 1636 876 760 346 282 246 603 274 592 105 168 712 13.4 999 13.0 4 4
14.00 1651 890 761 354 286 245 618 278 590 114 180 747 13.7 999 13.0 4 4
14.52 1657 902 755 358 292 248 678 295 640 156 216 833 14.5 999 13.0 5 5
14.98 1664 904 760 361 299 245 713 307 652 180 237 921 15.1 999 13.0 5 5
15.50 1674 916 758 370 304 247 757 312 673 205 250 943 15.3 999 13.0 5 5
16.01 1677 914 763 353 302 247 727 313 668 187 250 999 16.0 999 13.0 5 5
16.99 1680 922 758 361 304 246 756 310 677 194 245 *** **** *** **** 5 5
18.02 1686 913 773 366 303 246 734 301 655 185 215 *** **** *** **** 5 5
19.08 1687 924 763 371 309 247 793 322 702 255 330 *** **** *** **** 5 5
19.98 1684 916 768 364 304 247 703 291 658 162 195 *** **** *** **** 5 5
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   NO.68    NORMAL MALE   SOMATOTYPE:3.0,4.0,4.0
 9.52 1321 708 613 289 202 197 270 *** *** *** *** 256  8.4 377  6.2 1 1
10.00 1350 724 626 293 205 205 279 *** *** *** *** 256  8.4 419  6.8 1 1
10.55 1385 732 653 300 210 211 311 *** ***  43  75 272  9.0 494  7.5 1 1
11.00 1406 741 665 302 212 214 313 *** ***  41  77 275  9.1 509  7.7 2 1
11.26 1419 747 672 311 218 211 331 *** ***  47  86 285  9.4 535  8.0 2 1
11.55 1437 761 676 310 218 219 340 *** ***  45  83 293  9.7 584  8.6 2 1
11.74 1450 762 688 314 219 217 352 200 430  53  94 301  9.9 639  9.1 2 1
12.01 1469 772 697 314 221 223 358 201 427  51  84 305 10.1 647  9.2 3 1
12.26 1482 778 704 318 223 225 375 205 436  56  94 323 10.7 713  9.9 3 1
12.55 1500 784 716 321 226 230 388 205 435  53  92 323 10.7 752 10.3 3 1
12.76 1520 795 725 322 229 230 381 199 432  44  74 351 11.6 810 11.0 3 1
13.01 1530 797 733 325 229 232 390 201 421  48  71 356 11.8 829 11.2 3 2
13.26 1544 801 743 331 232 235 409 205 440  48  74 369 12.2 868 11.8 3 2
13.54 1568 812 756 335 237 238 429 213 442  50  81 384 12.5 911 12.4 4 3
13.75 1580 821 759 338 239 239 445 218 457  55  86 *** **** *** **** 4 3
13.98 1607 836 771 344 243 241 454 215 454  51  84 413 13.1 928 12.7 4 3
14.27 1637 859 778 351 249 247 490 224 465  58  85 526 14.3 991 14.2 5 3
14.54 1664 868 796 359 253 255 539 238 490  64  87 *** **** *** **** 5 4
15.00 1705 889 816 371 258 257 575 245 494  64  78 598 15.0 999 15.0 5 4
16.00 1742 916 826 381 264 259 601 252 510  74  84 *** **** *** **** 5 5
17.01 1756 924 832 390 270 261 612 260 503  73  78 991 17.8 999 15.0 5 5
18.01 1760 926 834 393 271 265 632 261 509  71  69 999 18.1 999 15.0 5 5
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   NO.69    NORMAL MALE   SOMATOTYPE:4.5,3.5,2.5
10.53 1355 719 636 287 201 201 279 *** *** *** *** 266  8.8 442  7.0 1 1
11.01 1382 729 653 290 203 206 293 *** *** *** *** 283  9.3 490  7.5 1 1
11.53 1415 745 670 298 209 215 315 *** ***  57  83 297  9.8 531  8.0 1 1
12.03 1442 749 693 304 212 220 329 *** ***  53  96 305 10.1 564  8.3 2 1
12.53 1465 762 703 307 213 225 338 *** ***  53  88 319 10.5 710  9.9 2 1
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AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING

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   NO.69    NORMAL MALE   SOMATOTYPE:4.5,3.5,2.5
12.79 1479 764 715 308 214 225 347 *** ***  50  80 371 12.2 729 10.1 2 1
13.02 1493 769 724 309 217 220 356 200 430  48  90 371 12.2 747 10.2 2 1
13.25 1504 779 725 311 220 229 354 201 426  53  82 371 12.2 760 10.4 3 1
13.54 1524 785 739 318 222 233 375 204 432  50  95 384 12.5 855 11.6 3 1
13.79 1549 790 759 324 225 236 397 207 442  51  92 384 12.5 904 12.4 3 1
14.02 1560 795 765 326 225 236 397 208 435  50  83 384 12.5 922 12.6 3 2
14.25 1574 808 766 331 230 240 413 211 445  50  75 454 13.7 943 13.0 4 2
14.53 1607 819 788 341 233 245 454 223 460  54  78 485 14.0 978 13.8 4 3
14.79 1632 840 792 346 236 247 463 218 450  52  73 569 14.7 999 15.0 5 3
15.04 1660 849 811 360 241 252 511 233 479  59  75 579 14.8 999 15.0 5 4
15.24 1677 858 819 360 243 258 527 238 492  61  82 589 14.9 999 15.0 5 4
15.53 1693 870 823 371 246 256 574 255 528  75  99 598 15.0 999 15.0 5 4
16.03 1717 883 834 372 249 258 590 261 522  70  99 670 15.5 999 15.0 5 5
17.03 1747 912 835 387 256 261 636 268 557  88 103 892 16.8 999 15.0 5 5
18.02 1758 912 846 395 257 262 659 278 562  92 111 999 18.1 999 15.0 5 5
20.04 1762 918 844 407 265 260 714 298 588 114 102 999 18.1 999 15.0 5 5
25.02 1762 921 841 415 275 263 819 329 626 202 167 *** **** *** **** 5 5
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   NO.70    NORMAL FEMALE   SOMATOTYPE:6.0,2.0,2.0
 7.54 1242 687 555 271 201 177 254 *** *** *** *** 316  7.3 681  8.3 1 1
 8.00 1275 720 555 278 203 180 259 *** *** *** *** 325  7.6 772  9.1 1 1
 8.53 1314 732 582 284 213 184 299 *** *** 110 130 348  8.2 772  9.1 1 1
 8.99 1343 742 601 288 218 190 313 *** *** 104 138 418  9.7 877 10.0 1 1
 9.55 1372 754 618 295 222 197 331 *** *** 105 137 456 10.3 916 10.5 1 1
10.01 1405 772 633 305 229 203 349 210 441  88 138 472 10.6 936 10.7 1 1
10.55 1440 784 656 317 230 205 379 215 456 108 143 507 11.0 952 11.0 3 1
10.78 1456 792 664 316 232 207 375 212 447  93 125 529 11.3 981 11.7 3 1
11.01 1475 800 675 320 236 209 375 209 451  86 117 553 11.7 992 12.2 3 1
11.30 1493 803 690 325 239 212 390 210 459  92 124 622 12.4 992 12.2 3 2
11.54 1510 816 694 330 242 215 404 209 459  90 113 692 13.2 999 13.0 4 2
11.79 1527 825 702 332 244 217 420 216 479  94 117 692 13.2 999 13.0 4 2
12.01 1543 832 711 336 247 218 429 215 482  94 114 692 13.2 999 13.0 5 3
12.29 1564 843 721 341 252 222 454 220 487 101 121 692 13.2 999 13.0 5 3
12.54 1579 843 736 344 255 222 463 220 483  88 118 695 13.2 999 13.0 5 4
12.79 1592 850 742 349 257 223 481 223 500  86 120 695 13.2 999 13.0 5 4
13.00 1604 860 744 352 257 224 488 222 498  80 112 725 13.5 999 13.0 5 4
13.29 1620 872 748 356 264 221 508 228 552  86 127 767 13.9 999 13.0 5 4
13.54 1624 875 749 358 264 224 519 230 510  96 125 779 14.0 999 13.0 5 4
13.79 1628 879 749 360 269 225 539 240 527 127 134 808 14.3 999 13.0 5 5
14.00 1630 879 751 365 269 224 532 238 519 113 141 856 14.7 999 13.0 5 5
14.53 1639 885 754 371 278 230 583 253 548 170 175 981 15.6 999 13.0 5 5
15.01 1649 898 751 375 283 230 605 263 565 195 195 999 16.0 999 13.0 5 5
15.55 1648 895 753 377 280 230 606 262 558 145 170 999 16.0 999 13.0 5 5
16.01 1649 899 750 377 286 227 618 267 569 190 194 999 16.0 999 13.0 5 5
17.01 1651 907 744 380 288 226 646 273 590 190 186 999 16.0 999 13.0 5 5
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   NO.71    NORMAL MALE   SOMATOTYPE:3.5,4.5,3.0
13.04 1486 789 697 322 *** *** 415 *** *** *** *** *** **** *** **** 3 2
13.54 1541 821 720 331 *** *** 460 *** *** *** *** *** **** *** **** 4 3
13.77 1570 839 731 337 *** *** 478 *** *** *** *** *** **** *** **** 4 4
14.04 1601 853 748 350 *** *** 508 *** *** *** *** *** **** *** **** 5 4
14.31 1624 867 757 353 *** *** 540 *** *** *** *** 537 14.5 999 15.0 5 5
14.54 1647 879 768 354 *** *** 544 *** *** *** *** 598 15.0 999 15.0 5 5
14.77 1663 887 776 371 284 *** 556 *** *** *** *** 598 15.0 999 15.0 5 5
15.05 1681 901 780 379 284 *** 585 *** *** *** *** 605 15.0 999 15.0 5 5
15.30 1691 902 789 385 287 *** 603 *** *** *** *** 626 15.2 999 15.0 5 5
15.55 1700 909 791 386 289 *** 617 *** *** *** *** 644 15.3 999 15.0 5 5
15.78 1711 919 792 391 291 *** 615 *** *** *** *** 725 15.9 999 15.0 5 5
16.05 1715 925 790 394 293 *** 633 *** *** *** *** 813 16.3 999 15.0 5 5
16.32 1719 941 778 397 293 *** 658 *** *** *** *** 832 16.5 999 15.0 5 5
16.55 1724 941 783 400 294 266 667 *** *** *** *** 851 16.6 999 15.0 5 5
17.05 1731 948 783 405 294 268 644 *** *** *** *** 999 18.1 999 15.0 5 5
18.04 1735 950 785 404 295 268 660 *** ***  80  52 999 18.1 999 15.0 5 5
19.04 1736 954 782 411 298 270 667 *** ***  73  47 999 18.1 999 15.0 5 5
20.13 1748 963 785 412 301 271 681 277 534  87  59 *** **** *** **** 5 5
21.11 1751 967 784 413 301 271 670 272 535  81  46 *** **** *** **** 5 5
25.04 1748 965 783 421 302 274 670 275 530  88  50 *** **** *** **** 5 5
30.04 1744 967 777 419 304 275 685 279 547  91  69 *** **** *** **** 5 5
34.06 1748 969 779 418 304 274 718 298 567 107  70 *** **** *** **** 5 5
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   NO.72    NORMAL MALE   SOMATOTYPE:4.0,3.5,3.0
14.97 1500 770 730 311 *** *** 340 *** *** *** *** *** **** *** **** 3 1
15.21 1517 772 745 316 *** *** 365 *** *** *** *** *** **** *** **** 3 1
15.56 1529 776 753 318 *** *** 377 *** *** *** *** *** **** *** **** 3 1
15.96 1559 799 760 319 *** *** 392 *** *** *** *** *** **** *** **** 3 1
16.23 1586 808 778 326 *** *** 422 *** *** *** *** 445 13.6 991 14.2 4 1
16.46 1598 819 779 340 *** *** 449 *** *** *** *** 457 13.7 999 15.0 4 2
16.98 1639 839 800 352 250 *** 483 *** *** *** *** 579 14.8 999 15.0 4 3
17.23 1654 849 805 358 253 *** 497 *** *** *** *** 589 14.9 999 15.0 5 4
17.47 1666 859 807 358 256 *** 526 *** *** *** *** 589 14.9 999 15.0 5 4
17.70 1678 873 805 362 256 *** 519 *** *** *** *** 605 15.0 999 15.0 5 4
17.97 1679 877 802 371 259 *** 535 *** *** *** *** 632 15.2 999 15.0 5 4
18.47 1690 882 808 377 264 248 553 *** *** *** *** 687 15.6 999 15.0 5 5
18.97 1699 885 814 380 266 248 572 *** *** *** *** *** **** *** **** 5 5
19.97 1707 901 806 385 268 248 590 *** ***  68  72 991 17.8 999 15.0 5 5
20.96 1711 901 810 389 272 250 576 *** ***  69  56 999 18.1 999 15.0 5 5
24.97 1726 917 809 397 270 253 618 256 512  78  58 999 18.1 999 15.0 5 5
29.97 1724 912 812 399 275 254 638 263 525  89  74 999 18.1 999 15.0 5 5
34.99 1721 916 805 395 278 253 658 280 545 101  96 *** **** *** **** 5 5
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AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING

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   NO.73    NORMAL MALE   SOMATOTYPE:4.0,4.5,2.0
13.55 1586 816 770 332 *** *** 435 *** *** *** *** *** **** *** **** 3 1
13.76 1595 815 780 338 *** *** 510 *** *** *** *** *** **** *** **** 3 1
14.01 1620 823 797 333 *** *** 524 *** *** *** *** *** **** *** **** 3 2
14.27 1640 835 805 345 *** *** 551 *** *** *** *** *** **** *** **** 4 3
14.53 1655 839 816 360 *** *** 569 *** *** *** *** *** **** *** **** 4 4
14.78 1674 860 814 364 *** *** 594 *** *** *** *** 589 14.9 999 15.0 4 4
15.02 1695 862 833 364 *** *** 610 *** *** *** *** 589 14.9 999 15.0 4 5
15.35 1706 877 829 375 273 *** 624 *** *** *** *** 605 15.0 999 15.0 4 5
15.52 1716 886 830 379 279 *** 644 *** *** *** *** 605 15.0 999 15.0 4 5
15.77 1720 888 832 380 280 *** 658 *** *** *** *** 653 15.4 999 15.0 4 5
16.01 1730 895 835 385 285 *** 685 *** *** *** *** 757 16.0 999 15.0 4 5
16.51 1744 906 838 387 283 *** 678 *** *** *** *** 864 16.6 999 15.0 4 5
17.07 1759 915 844 392 287 276 723 *** *** *** *** 906 16.9 999 15.0 5 5
17.55 1759 916 843 394 291 281 714 *** *** *** *** 925 17.0 999 15.0 5 5
18.01 1768 922 846 396 292 277 751 *** *** *** *** 999 18.1 999 15.0 5 5
19.01 1772 931 841 400 298 285 760 *** ***  97  92 999 18.1 999 15.0 5 5
20.08 1775 928 847 400 300 283 726 278 559  94  90 *** **** *** **** 5 5
21.02 1776 928 848 407 299 273 751 298 578 103 100 *** **** *** **** 5 5
25.00 1782 950 832 411 304 278 821 304 605 132 120 *** **** *** **** 5 5
30.01 1774 947 827 420 318 279 920 338 660 240 174 *** **** *** **** 5 5
35.08 1777 951 826 417 317 280 979 340 651 285 170 *** **** *** **** 5 5
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   NO.74    NORMAL MALE   SOMATOTYPE:2.0,6.0,3.0
 9.61 1318 700 618 285 *** *** 279 *** *** *** *** *** **** *** **** 1 1
10.03 1340 719 621 292 *** *** 297 *** *** *** *** 305 10.1 774 10.6 1 1
10.53 1363 719 644 294 210 *** 313 *** *** *** *** 317 10.5 821 11.1 1 1
11.02 1387 731 656 303 213 *** 324 *** *** *** *** 334 11.0 872 11.9 1 1
11.52 1420 746 674 303 217 *** 333 *** *** *** *** 359 11.9 885 12.1 1 1
12.02 1436 756 680 310 218 223 354 *** *** *** *** 397 12.8 922 12.6 1 1
12.55 1461 757 704 314 226 226 363 *** *** *** *** 441 13.5 962 13.4 1 1
13.01 1480 767 713 318 226 231 374 *** *** *** *** 466 13.8 987 14.1 2 1
13.55 1505 780 725 323 229 233 395 *** *** *** *** 466 13.8 999 15.0 3 1
13.76 1514 788 726 325 231 237 404 *** ***  46  54 477 13.9 999 15.0 3 1
14.01 1524 791 733 330 231 237 415 *** ***  43  58 477 13.9 999 15.0 3 1
14.24 1538 798 740 336 236 241 433 *** ***  44  60 528 14.4 999 15.0 4 1
14.55 1559 808 751 339 241 243 440 *** ***  44  58 528 14.4 999 15.0 4 1
14.76 1575 813 762 343 242 246 463 *** ***  47  54 549 14.6 999 15.0 4 2
15.03 1596 828 768 349 249 247 494 243 467  52  60 549 14.6 999 15.0 4 3
15.54 1629 846 783 360 253 257 547 266 485  55  60 549 14.6 999 15.0 5 5
16.02 1659 873 786 373 254 257 583 272 494  57  55 620 15.1 999 15.0 5 5
16.54 1669 883 786 374 255 256 606 285 502  55  53 785 16.2 999 15.0 5 5
17.02 1680 893 787 378 256 262 620 294 498  57  48 975 17.5 999 15.0 5 5
18.02 1688 900 788 391 257 260 645 300 514  67  52 999 18.1 999 15.0 5 5
19.11 1700 907 793 391 263 260 648 311 511  71  52 999 18.1 999 15.0 5 5
20.01 1702 905 797 394 264 262 656 315 523  75  49 *** **** *** **** 5 5
25.01 1709 911 798 402 262 262 652 326 500  81  42 *** **** *** **** 5 5
30.09 1707 909 798 400 261 262 636 313 486  75  48 *** **** *** **** 5 5
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   NO.75    NORMAL MALE   SOMATOTYPE:2.0,5.0,4.0
12.02 1621 839 782 344 268 246 515 235 513  84 113 386 12.6 947 13.1 3 1
12.27 1644 849 795 347 274 250 547 238 527  73 100 394 12.8 947 13.1 4 2
12.50 1670 858 812 349 277 253 565 233 523  72  95 394 12.8 962 13.4 4 2
12.73 1698 873 825 358 281 260 574 235 525  68  85 426 13.3 978 13.8 4 3
13.02 1726 882 844 364 288 262 608 239 525  75  82 439 13.5 991 14.2 4 4
13.27 1755 898 857 375 292 269 636 242 530  68  75 439 13.5 999 15.0 5 4
13.52 1783 907 876 383 297 271 649 245 540  70  73 577 14.8 999 15.0 5 5
14.02 1826 933 893 392 303 274 697 252 560  73  75 605 15.0 999 15.0 5 5
14.52 1850 938 912 402 306 274 747 259 572  78  74 632 15.2 999 15.0 5 5
15.01 1872 954 918 408 311 274 776 264 579  84  77 728 15.9 999 15.0 5 5
15.51 1888 962 926 415 315 275 787 268 578  83  72 762 16.1 999 15.0 5 5
16.13 1903 979 924 422 316 279 785 270 573  84  67 982 17.6 999 15.0 5 5
17.00 1904 981 923 426 318 280 830 281 596  97  82 999 18.1 999 15.0 5 5
18.00 1917 993 924 429 318 281 843 284 597 103  74 999 18.1 999 15.0 5 5
19.00 1917 995 922 433 322 *** 841 288 605  98  62 *** **** *** **** 5 5
25.09 1912 985 927 427 322 279 796 276 576  96  60 *** **** *** **** 5 5
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   NO.76    NORMAL MALE   SOMATOTYPE:4.5,3.5,2.5
10.53 1355 719 636 287 201 201 279 *** *** *** *** 266  8.8 442  7.0 1 1
11.01 1382 729 653 290 203 206 293 *** *** *** *** 283  9.3 490  7.5 1 1
11.53 1415 745 670 298 209 215 315 *** ***  57  83 297  9.8 531  8.0 1 1
12.03 1442 749 693 304 212 220 329 *** ***  53  96 305 10.1 564  8.3 2 1
12.53 1465 762 703 307 213 225 338 *** ***  53  88 319 10.5 710  9.9 2 1
12.79 1479 764 715 308 214 225 347 *** ***  50  80 371 12.2 729 10.1 2 1
13.02 1493 769 724 309 217 220 356 200 430  48  90 371 12.2 747 10.2 2 1
13.25 1504 779 725 311 220 229 354 201 426  53  82 371 12.2 760 10.4 3 1
13.54 1524 785 739 318 222 233 375 204 432  50  95 384 12.5 855 11.6 3 1
13.79 1549 790 759 324 225 236 397 207 442  51  92 384 12.5 904 12.4 3 1
14.02 1560 795 765 326 225 236 397 208 435  50  83 384 12.5 922 12.6 3 2
14.25 1574 808 766 331 230 240 413 211 445  50  75 454 13.7 943 13.0 4 2
14.53 1607 819 788 341 233 245 454 223 460  54  78 485 14.0 978 13.8 4 3
14.79 1632 840 792 346 236 247 463 218 450  52  73 569 14.7 999 15.0 5 3
15.04 1660 849 811 360 241 252 511 233 479  59  75 579 14.8 999 15.0 5 4
15.24 1677 858 819 360 243 258 527 238 492  61  82 589 14.9 999 15.0 5 4
15.53 1693 870 823 371 246 256 574 255 528  75  99 598 15.0 999 15.0 5 4
16.03 1717 883 834 372 249 258 590 261 522  70  99 670 15.5 999 15.0 5 5
17.03 1747 912 835 387 256 261 636 268 557  88 103 892 16.8 999 15.0 5 5
18.02 1758 912 846 395 257 262 659 278 562  92 111 999 18.1 999 15.0 5 5
20.04 1762 918 844 407 265 260 714 298 588 114 102 999 18.1 999 15.0 5 5
25.02 1762 921 841 415 275 263 819 329 626 202 167 *** **** *** **** 5 5
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NO.77 NORMAL MALE SOMATOTYPE:3.0,4.0,3.5

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
11.50	1384	734	650	310	***	***	343	***	***	***	***	373	12.3	943	13.0	2	1
12.01	1417	751	666	315	228	***	367	***	***	***	***	408	13.0	943	13.0	3	1
12.51	1463	775	688	327	232	***	401	***	***	***	***	421	13.2	962	13.4	4	2
12.84	1502	800	702	335	237	***	431	***	***	***	***	439	13.5	962	13.4	4	3
13.01	1518	809	709	339	238	***	442	***	***	***	***	500	14.1	999	15.0	4	4
13.28	1552	824	728	349	242	248	465	***	***	***	***	500	14.1	999	15.0	4	4
13.51	1570	840	730	351	247	249	478	***	***	***	***	510	14.2	999	15.0	5	4
13.72	1590	847	743	357	249	252	494	***	***	***	***	519	14.2	999	15.0	5	5
14.01	1607	859	748	365	255	252	522	***	***	***	***	605	15.0	999	15.0	5	5
14.26	1620	866	754	369	258	253	524	***	***	***	***	644	15.3	999	15.0	5	5
14.49	1634	879	755	373	258	256	535	***	***	***	***	651	15.4	999	15.0	5	5
15.00	1657	891	766	381	261	255	558	***	***	69	60	731	15.9	999	15.0	5	5
16.00	1684	920	764	389	267	257	578	***	***	73	63	978	17.5	999	15.0	5	5
17.01	1697	924	773	395	271	258	599	251	516	75	60	999	18.1	999	15.0	5	5
18.01	1702	931	771	399	272	260	617	272	520	93	65	999	18.1	999	15.0	5	5
19.01	1705	938	767	402	274	260	627	267	520	86	60	***	****	***	****	5	5
20.01	1708	953	755	400	274	261	617	271	523	93	62	***	****	***	****	5	5
25.01	1707	948	759	405	272	262	606	266	501	81	59	***	****	***	****	5	5
30.03	1705	946	759	401	273	262	601	265	506	87	62	***	****	***	****	5	5

NO:78 BOY BIRTH WT:2750 SD(ADJ):-1.5
DIAGNOSIS:H S FATHERS HT:177.8 MOTHERS HT:152.4

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
1.53	658	406	252	154	110	***	67	135	245	115	92	16	.2	179	1.1	*	*
2.01	678	430	248	157	110	***	65	133	236	74	103	16	.2	179	1.1	*	*
3.00	721	436	285	160	117	***	69	135	240	79	103	16	.2	181	1.4	*	*
3.96	748	448	300	169	118	***	77	137	254	110	107	38	1.8	181	1.4	*	*
4.98	776	474	302	179	127	***	87	147	260	118	137	55	2.1	188	2.1	*	*
6.20	813	478	335	186	134	***	95	145	269	114	122	87	2.7	192	2.5	*	*
6.41	853	506	347	195	136	***	106	141	274	80	76	114	3.4	206	3.2	*	*
6.66	900	527	373	205	143	***	118	146	294	82	71	135	4.0	206	3.2	*	*
6.93	936	547	389	210	151	***	127	150	299	87	74	139	4.2	206	3.2	*	*
7.18	967	561	406	217	154	***	138	158	318	92	84	144	4.3	220	3.8	*	*
7.51	1014	589	425	225	157	***	151	162	325	86	70	150	4.5	241	4.3	*	*
7.76	1036	603	433	231	162	***	166	168	335	90	78	167	5.1	241	4.3	*	*
7.99	1058	618	440	237	166	***	177	167	347	104	71	181	5.6	261	4.6	*	*
8.20	1083	630	453	242	169	***	181	171	350	98	63	194	6.1	261	4.6	*	*
8.43	1103	635	468	246	170	***	191	176	366	100	65	201	6.4	261	4.6	*	*
8.68	1119	650	469	248	176	***	213	185	388	122	93	235	7.6	287	5.1	*	*
8.93	1138	657	481	254	177	***	217	187	383	117	105	241	7.8	326	5.6	*	*
9.17	1153	667	486	254	179	***	218	187	380	95	85	247	8.0	384	6.3	*	*
9.50	1179	671	508	262	181	***	236	200	402	119	105	247	8.0	417	6.8	*	*
9.75	1197	680	517	262	187	***	249	206	414	155	117	251	8.2	449	7.0	*	*
10.02	1214	689	525	266	188	***	254	204	412	143	115	254	8.3	457	7.1	*	*
10.29	1233	691	542	271	189	***	255	204	408	143	114	254	8.3	516	7.8	*	*
10.52	1245	696	549	276	192	***	265	210	415	131	104	273	9.0	591	8.6	*	*
10.82	1265	710	555	277	190	***	283	214	431	190	122	291	9.6	610	8.8	*	*
11.09	1281	716	565	282	194	***	286	213	433	140	106	304	10.0	655	9.3	*	*
11.34	1296	721	575	285	199	***	292	216	434	140	112	317	10.5	655	9.3	*	*
11.59	1305	725	580	286	198	***	294	212	432	130	103	324	10.7	655	9.3	*	*
11.86	1322	731	591	290	202	***	307	220	441	150	115	332	11.0	758	10.4	1	1
12.09	1331	734	597	292	200	***	311	215	439	152	110	332	11.0	775	10.6	1	1
12.34	1342	738	604	295	203	***	322	221	450	148	114	342	11.3	841	11.4	1	1
12.57	1357	744	613	294	206	***	333	232	458	150	121	352	11.7	855	11.6	1	1
12.82	1356	748	608	296	214	***	342	234	472	230	172	380	12.4	876	11.9	1	1
13.09	1356	749	607	295	206	***	343	232	465	235	170	397	12.8	876	11.9	1	1
13.33	1373	746	627	296	208	***	346	233	459	200	146	417	13.2	893	12.2	1	1
13.60	1381	751	630	303	213	***	360	244	469	175	156	430	13.4	919	12.6	1	1
13.85	1391	759	632	306	214	***	380	248	489	222	173	447	13.6	919	12.6	1	1
14.12	1402	764	638	307	218	***	386	245	491	230	174	447	13.6	919	12.6	1	1
14.29	1411	766	645	309	217	***	387	248	488	200	154	447	13.6	938	12.9	1	1
14.56	1423	772	651	311	219	***	407	255	506	212	156	447	13.6	975	13.7	1	1
14.79	1434	779	655	314	220	***	422	252	510	174	160	510	14.2	975	13.7	1	1
15.06	1443	779	664	315	223	227	423	250	506	192	164	521	14.3	975	13.7	1	1
15.56	1477	787	690	323	229	231	454	259	520	210	160	598	15.0	999	15.0	3	3
16.06	1513	815	698	337	236	234	517	276	545	230	194	611	15.1	999	15.0	3	3
16.56	1531	824	707	344	250	237	561	287	564	275	204	651	15.4	999	15.0	4	5
16.86	1546	828	718	348	255	238	599	301	578	295	230	687	15.6	999	15.0	4	5
17.03	1550	840	710	354	263	237	631	314	595	362	290	865	16.6	999	15.0	4	5
17.51	1562	853	709	357	261	237	638	316	595	355	220	983	17.6	999	15.0	4	5
18.03	1572	856	716	361	269	240	691	329	610	362	224	999	18.1	999	15.0	4	5
18.57	1576	854	722	376	288	240	719	333	621	360	240	999	18.1	999	15.0	4	5
19.10	1584	867	717	377	281	241	773	354	650	410	255	999	18.1	999	15.0	5	5

NO:79 BOY BIRTH WT:4111 SD(ADJ): 1.5
DIAGNOSIS:H S FATHERS HT:175.3 MOTHERS HT:162.6

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
3.42	798	487	311	174	133	***	98	156	268	68	112	***	****	***	****	*	*
3.65	807	501	306	184	136	***	106	159	273	74	122	44	1.9	179	1.1	*	*
3.90	815	503	312	183	136	***	100	156	270	64	120	50	2.0	179	1.1	*	*
4.34	827	506	321	184	138	***	102	155	270	64	93	57	2.1	179	1.1	*	*
4.72	840	503	337	185	138	***	107	152	268	71	103	60	2.2	186	1.9	*	*
4.97	872	517	355	191	146	***	115	152	273	53	71	73	2.5	186	1.9	*	*
5.25	912	539	373	204	152	***	122	154	276	48	63	93	2.8	186	1.9	*	*
5.52	936	556	380	208	156	***	131	150	295	58	72	105	3.2	195	2.7	*	*
5.75	956	569	387	210	159	***	134	149	292	50	70	112	3.4	199	2.9	*	*
5.98	973	573	400	214	160	***	140	151	288	53	68	146	4.4	206	3.2	*	*
6.23	986	576	410	214	160	***	139	150	295	49	66	146	4.4	206	3.2	*	*
6.44	1000	581	419	218	163	***	149	156	302	60	71	150	4.5	226	4.0	*	*
6.81	1022	601	421	222	165	***	154	159	310	51	68	153	4.6	226	4.0	*	*
7.06	1038	603	435	223	166	***	158	160	309	51	65	185	5.8	226	4.0	*	*
7.30	1048	604	444	226	167	***	164	163	319	55	69	194	6.1	248	4.4	*	*
7.58	1065	618	447	228	170	***	166	157	324	51	65	197	6.2	263	4.7	*	*
7.78	1076	626	450	233	172	***	168	159	322	49	66	197	6.2	263	4.7	*	*
8.06	1089	631	458	235	174	***	175	163	331	49	63	201	6.4	284	5.0	*	*
8.32	1105	632	473	240	176	***	187	173	341	52	69	201	6.4	327	5.6	*	*
8.55	1106	638	468	239	176	***	192	178	348	70	98	211	6.8	327	5.6	*	*
8.84	1107	636	471	240	177	***	193	188	356	85	140	218	7.0	384	6.3	*	*
9.07	1125	645	480	243	180	***	192	174	347	55	85	242	7.8	413	6.7	*	*
9.33	1137	649	488	247	183	***	199	174	342	50	67	242	7.8	440	7.0	*	*
9.59	1154	656	498	249	184	***	205	177	351	56	81	256	8.4	461	7.2	*	*

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NO:79 BOY BIRTH WT:4111 SD(ADJ): 1.5
DIAGNOSIS:H S FATHERS HT:175.3 MOTHERS HT:162.6

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
9.85	1172	664	508	251	186	***	213	178	356	63	77	256	8.4	537	8.0	*	*
10.08	1184	658	526	255	188	***	219	183	366	59	81	256	8.4	547	8.1	*	*
10.35	1198	669	529	257	191	***	224	182	372	51	77	256	8.4	555	8.2	*	*
10.60	1209	666	543	258	192	***	231	184	369	60	77	264	8.7	575	8.5	*	*
10.87	1223	670	553	261	193	194	236	185	380	62	80	270	8.9	598	8.7	1	1
11.33	1244	674	570	265	195	199	245	183	377	57	78	270	8.9	611	8.8	1	1
11.83	1263	683	580	271	196	202	252	186	390	63	86	298	9.8	637	9.1	1	1
12.31	1278	692	586	274	199	203	261	191	397	65	75	***	****	***	****	1	1
12.61	1292	696	596	276	202	205	266	188	391	64	70	323	10.6	684	9.6	1	1
12.83	1300	695	605	277	203	206	265	190	398	63	83	334	11.1	801	10.9	1	1
13.09	1309	700	609	280	204	208	276	197	401	58	80	***	****	***	****	1	1
13.32	1321	705	616	282	206	210	283	193	401	53	74	***	****	***	****	1	1
13.78	1331	701	630	284	208	211	289	199	409	56	85	356	11.8	847	11.5	1	1
14.33	1354	716	638	291	213	215	307	202	418	61	85	***	****	***	****	1	1
14.78	1372	726	646	293	217	217	324	212	440	73	101	376	12.3	916	12.5	1	1
15.29	1391	730	661	296	217	221	331	212	431	65	97	***	****	***	****	1	1
15.78	1415	745	670	302	223	223	353	213	445	58	110	412	13.1	957	13.2	1	1
16.30	1434	750	684	307	226	229	356	215	449	53	89	***	****	***	****	2	1
16.81	1464	763	701	311	230	233	385	223	459	59	103	477	13.9	999	15.0	2	2
17.33	1487	779	708	317	233	239	404	228	474	60	105	489	14.0	999	15.0	2	2
17.83	1504	788	716	324	240	241	440	245	497	81	133	489	14.0	999	15.0	2	2
18.33	1524	793	731	326	241	242	433	239	481	62	111	549	14.6	999	15.0	2	2
18.83	1533	798	735	323	244	244	437	233	473	73	120	549	14.6	999	15.0	2	2
19.30	1553	812	741	333	247	***	450	***	***	86	140	549	14.6	999	15.0	3	3
19.80	1558	816	742	337	250	244	465	251	491	90	151	549	14.6	999	15.0	2	3

NO:80 BOY BIRTH WT:3146 SD(ADJ): -.9
DIAGNOSIS:H S FATHERS HT:176.0 MOTHERS HT:167.5

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
6.00	932	553	379	205	149	140	122	150	277	68	94	84	2.7	199	2.9	1	1
6.21	943	559	384	206	150	146	138	148	285	66	106	86	2.7	199	2.9	1	1
6.46	956	556	400	207	155	144	135	158	304	80	118	95	2.9	226	4.0	1	1
6.65	962	564	398	210	154	145	134	163	290	96	112	112	3.4	247	4.4	1	1
6.90	967	571	396	214	161	148	137	163	303	84	108	112	3.4	247	4.4	1	1
7.24	1004	584	420	223	163	153	152	159	304	78	94	***	****	***	****	1	1
7.51	1021	592	429	222	162	154	154	162	306	66	81	117	3.5	261	4.6	1	1
7.75	1039	598	441	228	163	159	159	164	310	68	84	***	****	***	****	1	1
7.95	1049	599	450	227	163	161	155	162	304	52	73	148	4.5	290	5.1	1	1
8.46	1084	615	469	234	170	167	172	163	321	51	70	***	****	***	****	1	1
8.96	1111	629	482	242	170	173	182	165	326	44	56	199	6.3	433	6.9	1	1
9.47	1140	645	495	247	175	177	192	164	331	44	56	***	****	***	****	1	1
9.95	1162	650	512	251	179	181	206	178	343	48	65	283	9.3	486	7.4	1	1
10.47	1180	665	515	252	181	181	208	173	344	43	62	***	****	***	****	1	1
10.72	1193	663	530	255	182	185	212	174	353	41	65	283	9.3	562	8.3	1	1
10.98	1202	666	536	259	182	187	208	171	337	41	55	290	9.6	632	9.0	1	1
11.27	1219	674	545	262	183	190	219	169	240	42	52	297	9.8	659	9.3	1	1
11.52	1231	675	556	261	186	190	218	175	352	45	59	312	10.3	729	10.1	1	1
12.00	1253	690	563	265	189	197	233	179	367	46	62	334	11.0	747	10.2	1	1
12.53	1271	696	575	270	192	198	242	180	368	52	70	***	****	***	****	1	1
13.01	1300	709	591	277	197	204	254	186	379	48	65	342	11.3	829	11.2	1	1

NO:81 BOY BIRTH WT:3033 SD(ADJ): -.9
DIAGNOSIS:TWIN FATHERS HT:176.0 MOTHERS HT:167.5

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
6.00	1078	626	452	234	171	163	171	163	328	57	81	185	5.7	334	5.7	1	1
6.21	1093	628	465	233	170	167	178	158	317	37	70	191	6.0	376	6.2	1	1
6.46	1109	634	475	239	172	169	182	169	329	60	84	191	6.0	404	6.6	1	1
6.65	1123	641	482	240	173	170	182	170	336	68	82	211	6.8	430	6.9	1	1
6.90	1133	649	484	246	177	166	190	175	347	56	83	211	6.8	473	7.3	1	1
7.24	1158	660	498	255	181	175	203	181	355	52	110	***	****	***	****	1	1
7.51	1169	665	504	253	179	178	204	176	350	56	94	254	8.3	537	8.0	1	1
7.75	1182	669	513	256	179	182	216	179	364	65	98	***	****	***	****	1	1
7.95	1190	667	523	256	180	182	205	172	346	47	79	256	8.4	537	8.0	1	1
8.46	1214	674	540	263	182	184	212	172	351	47	72	***	****	***	****	1	1
8.96	1232	680	552	266	184	188	224	175	353	42	70	262	8.6	651	9.2	1	1
9.47	1259	693	566	268	187	193	234	179	373	44	64	***	****	***	****	1	1
9.95	1277	699	578	274	189	192	240	184	382	46	72	312	10.3	758	10.4	1	1
10.47	1293	706	587	276	192	195	249	180	384	50	73	***	****	***	****	*	*
10.72	1303	711	592	284	194	197	255	184	383	44	76	***	****	***	****	1	1
10.98	1320	714	606	282	194	198	256	182	380	42	63	338	11.2	803	10.9	1	1
11.26	1328	725	603	289	197	202	268	187	394	52	72	***	****	***	****	1	1
11.52	1337	727	610	286	196	202	275	188	399	54	77	342	11.3	842	11.4	1	1
12.00	1358	733	625	294	201	206	290	195	408	60	77	342	11.3	909	12.4	1	1
12.53	1375	740	635	297	203	210	294	193	399	58	82	***	****	***	****	1	1
13.01	1396	745	651	300	208	212	327	208	444	54	94	363	12.0	909	12.4	1	1

NO:82 GIRL BIRTH WT:2976 SD(ADJ): -.5 NO MENARCHE
DIAGNOSIS:H S FATHERS HT:177.3 MOTHERS HT:155.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
11.21	1101	607	494	247	192	***	202	177	372	137	142	319	7.4	485	6.1	*	*
11.53	1104	612	492	251	194	***	210	181	377	127	137	344	8.1	562	7.0	*	*
11.82	1120	620	500	254	196	***	214	190	377	185	136	344	8.1	586	7.3	*	*
12.15	1146	636	510	259	201	***	229	190	386	168	142	344	8.1	628	7.8	*	*
12.41	1147	635	512	261	205	***	243	192	397	185	140	344	8.1	699	8.5	*	*
12.64	1164	639	525	265	205	***	250	197	399	174	152	358	8.5	752	8.9	*	*
12.91	1191	655	536	271	206	***	265	205	417	200	150	366	8.7	795	9.3	1	1
13.16	1220	663	557	276	211	***	277	206	426	184	140	411	9.6	841	9.7	1	1
13.41	1235	672	563	279	216	***	274	203	417	173	130	419	9.7	873	10.0	1	1
13.60	1253	686	567	285	222	***	302	212	437	190	146	472	10.6	873	10.0	1	1
14.10	1264	693	571	287	224	***	317	219	455	208	170	482	10.7	947	10.9	1	1
14.58	1275	699	576	291	230	***	334	224	467	197	174	501	11.0	947	10.9	1	1
14.83	1305	709	596	298	235	***	347	225	470	193	172	526	11.3	947	10.9	2	1
15.07	1334	718	616	306	243	***	367	225	480	162	160	526	11.3	947	10.9	3	1
15.33	1354	732	622	310	239	***	379	233	477	202	154	547	11.6	989	12.0	3	2
15.58	1374	731	643	313	247	208	386	236	484	202	166	561	11.8	999	13.0	2	2
16.07	1409	754	655	320	248	212	417	235	501	206	177	561	11.8	999	13.0	4	3
16.57	1435	767	668	325	252	213	421	239	486	160	174	626	12.5	999	13.0	4	3
17.11	1436	766	670	327	258	214	448	246	507	240	205	692	13.2	999	13.0	4	3
17.63	1443	774	669	328	261	214	465	250	508	212	204	692	13.2	999	13.0	4	3
17.87	1463	782	681	334	270	216	499	256	534	220	190	695	13.2	999	13.0	4	3
18.05	1472	791	681	338	269	218	499	260	530	210	180	695	13.2	999	13.0	4	3

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NO:82 GIRL BIRTH WT:2976 SD(ADJ): -.5 NO MENARCHE
DIAGNOSIS:H S FATHERS HT:177.3 MOTHERS HT:155.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
18.33	1483	796	687	339	269	219	490	253	526	200	175	715	13.4	999	13.0	4	4
18.56	1496	799	697	339	273	220	494	264	521	205	177	715	13.4	999	13.0	4	4
19.12	1509	813	696	348	280	219	528	266	546	225	193	742	13.6	999	13.0	4	4
19.64	1527	822	705	347	277	220	524	255	535	195	172	742	13.6	999	13.0	4	5
20.14	1530	817	713	350	279	220	508	257	526	197	190	742	13.6	999	13.0	4	5
20.60	1530	819	711	349	275	220	516	242	495	212	163	768	13.9	999	13.0	4	5

NO:83 GIRL BIRTH WT:3629 SD(ADJ): .3 NO MENARCHE
DIAGNOSIS:H S FATHERS HT(EST)165.1 MOTHERS HT(EST)163.8

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
9.52	930	541	389	206	159	***	142	160	307	100	107	230	4.2	333	4.3	*	*
10.02	945	547	398	217	165	***	146	162	308	120	118	230	4.2	344	4.5	*	*
10.53	944	549	395	210	165	***	144	156	308	92	107	247	4.9	360	4.6	*	*
11.05	957	553	404	210	166	***	150	161	313	120	103	254	5.1	373	4.8	*	*
11.51	962	551	411	211	167	***	151	164	309	100	118	254	5.1	398	5.1	*	*
11.67	960	555	405	212	165	***	155	161	320	84	108	263	5.5	398	5.1	*	*
11.92	991	564	427	221	169	***	167	164	328	75	89	263	5.5	398	5.1	*	*
12.18	1028	586	442	230	176	***	181	171	342	84	90	276	5.9	453	5.8	*	*
12.43	1059	605	454	238	188	***	200	174	352	70	84	309	7.0	528	6.6	*	*
12.70	1093	613	480	246	192	***	214	179	367	78	95	321	7.4	543	6.7	*	*
12.93	1112	629	483	247	196	***	223	183	378	83	97	332	7.8	566	7.1	*	*
13.22	1137	640	497	252	203	***	242	190	390	84	105	332	7.8	610	7.6	*	*
13.47	1162	656	506	258	209	***	255	195	398	92	113	343	8.1	652	8.0	*	*
13.70	1179	661	518	259	212	***	267	200	405	107	113	343	8.1	682	8.3	*	*
13.95	1199	676	523	267	218	***	282	208	420	95	126	350	8.3	776	9.1	*	*
14.20	1225	680	545	273	222	***	298	211	434	113	142	358	8.5	819	9.5	*	*
14.44	1250	698	552	278	228	***	319	217	436	110	125	358	8.5	819	9.5	*	*
14.69	1268	707	561	279	226	***	314	213	437	97	116	366	8.7	834	9.6	*	*
14.92	1280	716	564	282	228	***	331	213	441	109	130	366	8.7	834	9.6	*	*
15.17	1299	720	579	286	235	***	343	224	459	114	130	371	8.9	855	9.8	*	*
15.44	1323	731	592	291	238	***	364	227	467	130	140	416	9.7	886	10.1	*	*
15.69	1343	738	605	292	240	***	367	227	467	95	130	453	10.3	923	10.6	*	*
15.92	1358	747	611	293	243	***	378	227	476	100	124	462	10.4	945	10.9	1	1
16.17	1375	758	617	297	245	***	391	230	480	107	148	462	10.4	958	11.1	1	1
16.42	1385	758	627	301	248	***	411	239	498	117	150	462	10.4	958	11.1	1	1
16.71	1407	768	639	303	252	***	415	246	483	126	154	462	10.4	981	11.7	1	1
16.94	1419	775	644	310	258	***	441	243	503	156	180	472	10.6	981	11.7	1	1
17.18	1428	776	652	311	260	***	440	247	506	184	184	495	10.9	981	11.7	1	1
17.45	1431	785	646	310	262	***	442	240	504	170	174	495	10.9	981	11.7	1	1
17.68	1440	778	662	311	260	***	443	243	500	160	182	543	11.5	981	11.7	1	1
17.95	1446	786	660	315	265	***	475	251	521	164	190	553	11.7	981	11.7	1	1
18.18	1465	797	668	318	269	***	482	253	527	166	200	553	11.7	992	12.2	1	1
18.45	1469	797	672	318	272	***	491	256	533	216	205	572	11.9	992	12.2	1	1
18.91	1474	800	674	320	271	***	494	257	532	200	210	582	12.0	999	13.0	1	1
19.43	1482	782	700	317	271	239	488	248	533	184	205	582	12.0	999	13.0	1	1
19.91	1503	787	716	322	272	241	490	252	523	140	211	582	12.0	999	13.0	1	1
20.18	1512	797	715	325	277	241	532	257	546	163	216	699	13.2	999	13.0	4	1
20.43	1529	805	724	332	293	244	563	265	559	210	217	715	13.4	999	13.0	4	1
20.67	1539	813	726	333	294	244	582	270	567	210	250	750	13.7	999	13.0	4	1
20.98	1550	819	731	338	305	245	619	282	590	210	250	750	13.7	999	13.0	4	1
21.48	1561	827	734	342	309	245	653	286	619	204	300	774	13.9	999	13.0	5	1
21.98	1567	831	736	345	312	246	663	292	617	225	335	796	14.1	999	13.0	5	1
24.07	1585	835	746	345	293	247	662	299	604	210	275	796	14.1	999	13.0	5	1

NO:84 BOY BIRTH WT:3855 SD(ADJ): .5
DIAGNOSIS:GHD GND FATHERS HT:165.1 MOTHERS HT:161.3

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
12.87	1195	648	547	259	186	***	211	188	363	51	112	235	7.6	517	7.8	*	*
13.31	1199	650	549	262	190	***	214	189	359	55	112	262	8.6	517	7.8	*	*
13.54	1199	653	546	262	190	***	236	205	380	69	160	274	9.1	517	7.8	*	*
13.90	1202	653	549	266	189	***	255	218	408	91	196	274	9.1	575	8.5	*	*
14.05	1222	666	556	272	192	***	268	217	405	81	158	274	9.1	610	8.8	*	*
14.38	1250	675	575	275	199	***	261	208	395	63	126	278	9.2	675	9.5	*	*
14.69	1272	688	584	278	204	***	269	207	395	63	109	287	9.5	730	10.1	*	*
14.95	1288	688	600	282	206	***	286	216	412	62	126	287	9.5	730	10.1	*	*
15.21	1314	700	614	286	209	***	285	213	400	53	111	290	9.6	730	10.1	1	1
15.45	1327	701	626	290	212	***	288	218	400	51	111	298	9.8	743	10.2	1	1
15.72	1339	705	634	292	213	***	296	214	395	51	105	333	11.0	769	10.5	1	1
16.03	1357	712	645	293	214	***	298	218	404	51	115	339	11.2	804	10.9	1	1
16.32	1358	722	636	297	216	***	313	223	418	53	122	339	11.2	804	10.9	1	1
16.55	1379	722	657	295	218	***	298	213	392	47	92	339	11.2	822	11.1	1	1
16.78	1386	723	663	297	221	***	313	220	411	53	113	339	11.2	834	11.3	1	1
17.05	1394	732	662	297	222	***	317	224	410	56	130	339	11.2	834	11.3	1	1
17.33	1413	736	677	303	224	***	325	224	414	54	117	346	11.5	855	11.6	1	1
17.58	1422	741	681	305	226	***	326	226	413	54	122	385	12.6	855	11.6	1	1
17.81	1429	738	691	306	227	***	326	223	415	50	115	400	12.9	872	11.9	1	1
18.14	1443	745	698	310	230	***	348	224	415	50	105	400	12.9	909	12.4	1	1
18.33	1453	750	703	311	232	***	341	223	419	53	108	406	13.0	909	12.4	1	1
18.58	1453	744	709	311	232	***	321	222	405	52	112	406	13.0	909	12.4	1	1
18.75	1451	746	705	307	234	***	330	225	411	52	120	406	13.0	909	12.4	1	1
19.34	1462	754	708	307	234	***	357	229	427	58	150	415	13.1	943	13.0	*	*
19.58	1468	756	712	307	238	***	362	229	440	56	144	415	13.1	943	13.0	1	1
19.88	1488	761	727	314	242	***	366	230	429	54	136	415	13.1	943	13.0	1	1
20.07	1489	757	732	317	243	***	356	230	430	51	125	415	13.1	943	13.0	1	1
20.34	1511	761	750	319	247	248	372	230	431	50	133	415	13.1	943	13.0	1	1
20.80	1530	761	769	321	248	248	371	229	429	50	124	415	13.1	943	13.0	1	1
21.34	1554	774	780	321	253	256	406	242	444	56	142	415	13.1	962	13.4	1	1
21.80	1579	789	790	335	261	259	434	249	466	54	155	***	****	***	****	1	1
22.32	1605	789	816	339	265	263	448	251	464	54	162	426	13.3	975	13.7	1	1
22.81	1618	796	822	339	267	266	444	247	457	50	147	***	****	***	****	1	1
23.31	1629	796	833	343	271	271	483	259	477	63	170	426	13.3	999	15.0	1	1
23.58	1653	811	842	348	277	270	492	262	482	57	172	581	14.8	999	15.0	2	3
23.83	1663	815	848	349	278	272	518	272	495	73	195	596	15.0	999	15.0	2	3
24.10	1680	822	858	349	279	272	512	265	487	74	162	674	15.5	999	15.0	4	3
24.33	1682	825	857	355	281	270	516	270	498	82	173	744	16.0	999	15.0	4	4
24.54	1690	828	862	362	283	271	532	268	490	73	159	773	16.1	999	15.0	4	5
24.79	1692	830	862	363	283	271	498	261	484	69	137	803	16.3	999	15.0	3	4
25.08	1699	834	865	364	285	272	519	263	482	71	157	815	16.4	999	15.0	4	5
25.54	1704	843	861	364	286	271	525	273	493	75	165	851	16.6	999	15.0	4	5

H S (HYPOSOMATOTROPHISM) = ISOLATED GROWTH HORMONE DEFICIENCY; GHD GND = GROWTH HORMONE DEFICIENCY + GONADOTROPHIN DEFICIENCY.

NO:85 BOY BIRTH WT:3600 SD(ADJ): -.3
DIAGNOSIS:CRANIOPHARYNGIOMA FATHERS HT(EST)175.3 MOTHERS HT(EST)163.8

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
6.08	1007	577	430	222	159	***	155	166	300	67	100	117	3.5	186	1.9	*	*
6.58	1047	590	457	223	162	***	146	144	273	63	81	158	4.8	222	3.9	*	*
7.58	1114	619	495	234	172	***	176	159	327	74	93	191	6.0	269	4.7	*	*
8.65	1170	640	530	242	178	***	196	169	340	69	108	215	6.9	342	5.8	*	*
9.42	1198	649	549	246	183	***	205	170	338	76	97	235	7.6	429	6.9	*	*
9.95	1206	652	554	252	184	***	231	187	373	123	140	246	8.0	439	6.9	*	*
10.42	1216	***	***	***	***	***	248	***	***	***	***	***	****	***	****	*	*
10.58	1211	662	549	254	188	***	246	196	387	142	142	246	8.0	439	6.9	*	*
10.85	1209	658	551	257	192	***	256	197	393	184	164	246	8.0	466	7.2	*	*
11.06	1227	663	564	259	190	***	251	193	384	144	131	246	8.0	509	7.7	*	*
11.33	1250	673	577	262	191	***	254	192	379	104	105	246	8.0	525	7.9	*	*
11.56	1270	678	592	265	193	***	257	188	384	95	102	246	8.0	544	8.1	*	*
11.83	1287	676	611	269	197	195	264	187	387	90	90	276	9.1	544	8.1	1	1
12.29	1288	682	606	268	201	195	284	204	406	155	133	276	9.1	552	8.2	1	1
12.79	1298	685	613	267	202	197	291	208	409	147	158	290	9.6	552	8.2	1	1
13.31	1332	697	635	273	201	204	294	199	403	76	103	***	****	***	****	1	1
13.82	1374	712	662	283	209	211	310	202	398	81	93	297	9.8	657	9.3	1	1
14.32	1404	723	681	290	217	213	330	201	407	91	99	***	****	***	****	1	1
14.82	1415	724	691	290	215	216	347	208	435	93	114	302	10.0	730	10.1	1	1
15.32	1428	731	697	292	216	221	344	206	428	104	110	***	****	***	****	1	1
15.78	1446	738	708	297	221	222	357	211	442	99	121	335	11.1	748	10.3	1	1
16.32	1484	748	736	300	231	228	376	210	446	92	108	362	12.0	765	10.4	1	1
16.58	1502	757	745	308	234	233	393	219	452	91	124	362	12.0	820	11.1	1	1
16.84	1522	768	754	311	235	235	414	221	458	86	125	369	12.2	906	12.4	2	1
17.08	1552	781	771	317	238	240	423	218	454	71	110	384	12.5	962	13.4	2	2
17.33	1574	794	780	321	240	241	430	218	455	65	103	490	14.1	978	13.8	3	3
17.56	1602	811	791	324	244	245	444	225	463	77	100	540	14.5	987	14.1	4	4
17.81	1623	815	808	330	246	247	438	213	448	78	90	598	15.0	999	15.0	4	4
18.33	1662	837	825	334	250	251	455	220	468	70	87	598	15.0	999	15.0	4	4
18.79	1692	852	840	341	262	252	510	231	476	81	110	598	15.0	999	15.0	5	4
19.29	1721	870	851	350	264	254	535	241	503	84	126	632	15.2	999	15.0	5	4
19.84	1739	874	865	354	264	256	540	237	488	80	108	701	15.7	999	15.0	5	4
20.38	1739	877	862	353	272	257	562	246	500	112	140	815	16.4	999	15.0	5	4

NO:86 GIRL BIRTH WT:3061 SD(ADJ): -.6 NO MENARCHE
DIAGNOSIS:CRANIOPHARYNGIOMA FATHERS HT(EST)182.9 MOTHERS HT(EST)160.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
8.13	1042	602	440	236	187	***	186	180	348	128	140	308	7.0	552	6.9	*	*
8.48	1059	611	448	240	187	***	192	185	357	180	160	314	7.2	621	7.7	*	*
8.57	1067	603	464	238	190	***	182	181	342	154	150	314	7.2	621	7.7	*	*
9.05	1071	606	465	239	192	***	190	182	360	147	152	339	8.0	698	8.5	*	*
9.32	1079	613	466	242	193	***	190	186	357	155	157	347	8.2	748	8.9	*	*
9.57	1083	615	468	238	194	***	192	186	362	166	165	363	8.6	748	8.9	*	*
9.76	1086	617	469	240	196	***	194	193	363	168	170	378	9.0	773	9.1	*	*
10.01	1107	623	484	245	198	***	185	169	336	94	107	378	9.0	796	9.3	*	*
10.28	1125	628	497	248	199	***	183	161	330	77	85	415	9.7	871	10.0	*	*
10.51	1140	646	494	253	203	***	199	166	360	114	106	415	9.7	871	10.0	1	1
10.78	1168	658	510	258	209	***	221	176	367	120	115	415	9.7	893	10.2	*	*
11.76	1192	658	534	262	214	177	254	202	405	225	214	443	10.1	929	10.7	1	1
12.29	1238	681	557	274	224	183	265	198	403	130	145	***	****	***	****	1	1
12.75	1266	693	573	276	225	187	282	203	413	142	167	453	10.3	952	11.0	1	1
13.27	1298	701	597	283	234	189	288	197	406	113	152	***	****	***	****	1	1
13.77	1326	710	616	290	238	191	307	204	423	142	160	471	10.5	992	12.2	1	1
14.25	1344	718	626	292	240	194	326	213	443	174	172	***	****	***	****	1	1
14.76	1363	730	633	301	252	195	365	228	471	200	226	526	11.3	999	13.0	1	1
15.25	1381	731	650	300	250	199	356	220	453	140	176	***	****	***	****	1	1
15.74	1402	740	662	305	256	201	385	229	485	170	210	526	11.3	999	13.0	1	1
16.26	1425	745	680	309	263	206	386	228	472	152	170	***	****	***	****	1	1
16.76	1448	758	690	319	269	207	436	243	502	172	204	551	11.6	999	13.0	1	1
17.27	1462	760	702	321	275	209	444	249	509	210	224	763	13.8	999	13.0	2	1
17.79	1477	771	706	319	275	209	464	262	522	230	270	813	14.3	999	13.0	4	1
18.29	1479	775	704	323	282	209	465	260	528	255	255	878	14.8	999	13.0	*	*

NO:87 GIRL BIRTH WT:3969 SD(ADJ): 1.1 AGE AT MENARCHE:12.8
DIAGNOSIS:HYPOTHYROID FATHERS HT(EST)182.9 MOTHERS HT(EST)162.6

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
5.61	984	588	396	239	169	***	188	176	330	58	110	53	1.2	169	1.4	*	*
5.82	1002	588	414	239	169	***	174	166	302	46	91	55	1.2	169	1.4	*	*
6.15	1054	600	454	246	178	***	179	159	292	49	72	142	2.2	169	1.4	*	*
6.47	1082	619	463	252	183	***	202	173	322	56	84	211	3.8	212	2.9	*	*
6.74	1119	640	479	266	191	***	217	178	333	57	110	242	4.7	239	3.3	*	*
6.97	1143	644	499	271	194	***	232	187	350	63	101	248	4.9	239	3.3	*	*
7.24	1173	658	515	278	199	***	248	192	361	67	106	264	5.5	279	3.8	*	*
7.49	1191	660	531	280	202	***	259	195	373	67	116	269	5.7	301	4.0	*	*
7.75	1215	683	532	288	206	***	272	203	388	73	109	269	5.7	333	4.3	*	*
8.02	1244	691	553	292	209	***	283	200	391	67	110	269	5.7	446	5.7	*	*
8.25	1264	694	570	294	211	***	284	198	394	63	113	276	5.9	493	6.2	*	*
8.77	1304	712	592	304	218	***	315	206	420	71	112	287	6.3	557	6.9	*	*
9.23	1340	723	617	308	223	***	330	205	423	72	120	338	8.0	620	7.7	*	*
9.83	1385	745	640	321	229	***	379	227	461	92	127	376	9.0	638	7.9	1	1
10.42	1433	763	670	326	239	***	415	233	489	111	141	421	9.8	839	9.7	1	1
10.92	1471	782	689	333	244	***	428	232	491	120	153	471	10.5	855	9.8	1	1
11.40	1507	789	718	343	250	***	485	244	524	131	176	566	11.8	981	11.7	2	1
11.89	1543	801	742	352	260	***	508	248	522	131	162	638	12.6	992	12.2	3	2
12.18	1568	810	758	357	260	***	535	250	551	93	167	***	****	***	****	3	3
12.43	1589	827	762	358	262	***	542	249	550	104	164	***	****	***	****	3	3
12.83	1612	845	767	363	268	***	568	244	551	94	158	692	13.2	999	13.0	3	4
13.83	1640	867	773	374	276	***	638	264	592	104	185	823	14.4	999	13.0	4	4
14.83	1655	877	778	377	272	259	670	272	601	108	213	939	15.2	999	13.0	5	5
15.80	1660	873	787	374	278	260	637	268	576	101	194	996	15.8	999	13.0	5	5

NO:88 GIRL BIRTH WT:**** SD(ADJ):**** AGE AT MENARCHE:13.9
DIAGNOSIS:HYPOTHYROID FATHERS HT(EST)171.4 MOTHERS HT(EST)170.2

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
4.59	758	488	270	165	129	***	114	175	295	59	109	***	****	***	****	*	*
4.78	771	494	277	175	133	***	105	162	169	53	102	53	1.2	162	.8	*	*
4.95	820	521	299	194	143	***	118	163	268	55	96	53	1.2	162	.8	*	*
5.36	894	561	333	209	161	***	152	192	312	101	135	154	2.4	209	2.8	*	*
5.51	914	575	339	218	164	***	158	191	312	116	134	204	3.6	241	3.3	*	*
5.78	950	595	355	220	170	***	161	186	322	96	137	252	5.0	335	4.4	*	*
6.26	998	616	382	235	176	***	183	197	334	114	157	303	6.9	391	5.0	*	*

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NO:88 GIRL BIRTH WT:**** SD(ADJ):**** AGE AT MENARCHE:13.9
DIAGNOSIS:HYPOTHYROID FATHERS HT(EST)171.4 MOTHERS HT(EST)170.2

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
6.72	1046	635	411	240	181	***	188	184	333	95	122	325	7.6	543	6.7	*	*
7.18	1090	655	435	248	184	***	189	180	333	75	134	335	7.9	575	7.2	*	*
7.67	1130	675	455	258	192	***	218	194	374	83	135	357	8.5	752	8.9	*	*
8.29	1193	702	491	268	198	***	224	182	375	73	135	364	8.7	796	9.3	*	*
8.69	1217	713	504	275	205	***	267	209	419	135	185	412	9.6	871	10.0	*	*
9.67	1292	732	560	287	212	***	295	218	424	116	124	482	10.7	958	11.1	*	*
10.66	1352	752	600	300	215	***	318	217	434	118	192	538	11.5	981	11.7	1	1
11.66	1403	779	624	312	227	***	319	206	429	87	128	561	11.7	992	12.2	2	1
12.66	1479	823	656	327	233	***	360	220	445	72	154	***	****	***	****	3	2
13.66	1554	852	702	343	247	233	424	224	483	65	138	748	13.7	992	12.2	4	4
14.65	1605	887	718	350	257	240	476	232	499	76	134	770	13.9	999	13.0	5	4
15.65	1622	903	719	362	265	240	555	259	557	116	149	978	15.6	999	13.0	5	5
16.87	1630	907	723	365	274	242	564	269	567	115	218	999	16.0	999	13.0	5	5

NO:89 GIRL BIRTH WT:**** SD(ADJ):**** AGE AT MENARCHE:18.2
DIAGNOSIS:SMALL/DELAY FATHERS HT(EST)167.6 MOTHERS HT(EST)162.6

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
11.83	1270	671	599	271	211	***	238	183	377	86	123	352	8.4	657	8.1	*	*
12.50	1299	685	614	273	211	***	239	183	378	59	86	356	8.5	773	9.1	*	*
13.02	1306	686	620	275	213	***	241	187	379	64	102	356	8.5	796	9.3	*	*
14.08	1341	699	642	286	223	***	267	198	392	84	123	383	9.1	819	9.5	*	*
14.51	1350	699	651	288	224	***	281	204	398	80	130	399	9.4	884	10.1	*	*
14.99	1358	699	659	289	227	***	284	202	402	66	125	406	9.6	901	10.3	*	*
15.51	1372	703	669	294	231	***	300	210	422	80	163	472	10.6	916	10.5	*	*
16.35	1405	723	682	303	236	***	325	219	433	74	153	563	11.8	952	11.0	1	1
16.85	1429	728	701	303	239	***	320	212	423	62	130	582	12.0	981	11.7	2	2
17.50	1475	746	729	308	245	***	317	189	400	50	90	688	13.1	992	12.2	2	3
17.98	1509	764	745	316	253	***	343	191	425	56	77	724	13.5	992	12.2	3	3
18.44	1530	777	753	321	259	***	352	189	420	60	82	752	13.7	999	13.0	4	3
18.98	1535	783	752	325	266	***	370	200	441	69	94	807	14.2	999	13.0	4	4
20.04	1544	793	751	328	273	***	385	207	442	72	114	999	16.0	999	13.0	4	4
21.16	1556	806	750	333	278	***	415	218	466	83	133	999	16.0	999	13.0	4	4

NO:90 BOY BIRTH WT:2948 SD(ADJ):-1.4
DIAGNOSIS:SMALL/DELAY FATHERS HT(EST)172.7 MOTHERS HT(EST)162.6

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
9.45	1113	643	470	249	173	***	183	157	324	47	76	213	6.8	432	6.9	*	*
10.06	1140	656	484	254	175	***	184	153	316	39	70	228	7.4	490	7.5	*	*
10.62	1166	660	506	256	179	***	190	156	328	44	64	238	7.7	533	8.0	*	*
11.36	1216	688	528	271	186	***	236	178	359	61	94	246	8.0	636	9.1	*	*
12.32	1265	695	570	279	186	***	246	171	355	58	93	291	9.6	731	10.1	*	*
12.82	1287	707	580	288	193	***	247	173	361	49	90	279	9.2	748	10.2	*	*
13.82	1337	729	608	299	199	210	283	179	396	54	94	334	11.0	826	11.2	1	1
14.35	1362	742	620	305	204	218	304	188	409	72	84	334	11.0	855	11.6	1	1
14.83	1392	751	641	313	209	221	323	193	411	63	106	347	11.5	870	11.8	3	2
15.83	1464	782	682	330	219	231	372	204	432	63	89	397	12.8	973	13.6	4	4
16.81	1560	839	721	345	237	243	435	213	445	70	80	510	14.2	999	15.0	4	4
17.83	1613	870	743	361	240	241	484	224	470	94	98	749	16.0	999	15.0	5	5
18.79	1632	884	748	377	254	242	522	229	491	91	110	926	17.0	999	15.0	5	5
19.82	1638	894	744	378	247	***	513	228	***	96	82	999	18.1	999	15.0	5	5

NO:91 BOY BIRTH WT:2920 SD(ADJ):-1.2
DIAGNOSIS:SMALL/DELAY FATHERS HT(EST)167.6 MOTHERS HT(EST)157.5

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
2.49	822	497	325	186	138	***	99	143	263	58	72	65	2.3	179	1.1	*	*
3.01	849	510	339	193	143	***	102	140	265	48	70	76	2.5	181	1.4	*	*
3.43	879	529	350	200	146	***	107	142	260	46	69	76	2.5	181	1.4	*	*
4.43	937	558	379	211	156	***	119	144	275	45	67	118	3.5	186	1.9	*	*
5.42	992	584	408	221	164	***	139	148	295	43	63	144	4.3	186	1.9	*	*
6.42	1036	598	438	232	172	***	150	150	299	38	56	164	5.0	222	3.9	*	*
7.41	1092	609	483	242	179	***	166	148	311	38	54	180	5.6	269	4.7	*	*
8.43	1147	636	511	251	187	***	184	153	330	39	51	197	6.2	301	5.3	*	*
9.60	1199	669	530	261	195	***	210	162	348	40	55	247	8.0	403	6.6	*	*
10.61	1242	686	556	271	202	***	226	164	357	40	49	282	9.3	531	7.9	*	*
11.59	1279	700	579	281	208	***	252	175	381	44	64	282	9.3	655	9.3	*	*
12.61	1325	709	616	294	215	***	279	182	410	48	65	293	9.7	774	10.5	*	*
14.60	1431	767	664	316	230	218	374	215	458	64	116	376	12.3	887	12.1	1	1
16.64	1574	847	727	357	254	232	530	262	527	86	172	744	16.0	999	15.0	4	4
17.64	1608	884	724	372	262	234	614	292	558	102	181	999	18.1	999	15.0	5	5
18.67	1633	886	747	378	275	236	607	272	562	82	125	999	18.1	999	15.0	5	5

NO:92 GIRL BIRTH WT:4252 SD(ADJ): 1.6 AGE AT MENARCHE:11.3
DIAGNOSIS:TALL/ADVANCED FATHERS HT(EST)177.8 MOTHERS HT(EST)172.7

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
2.13	972	595	377	228	174	***	195	191	404	104	105	182	3.0	233	3.2	*	*
3.13	1089	652	437	258	204	***	274	224	474	155	150	196	3.3	278	3.8	*	*
4.14	1191	685	506	267	204	***	299	217	471	139	132	214	3.8	437	5.6	*	*
5.39	1282	714	568	284	217	***	320	214	475	105	119	293	6.5	515	6.4	*	*
6.40	1346	746	600	297	221	***	359	227	506	125	154	312	7.1	558	7.0	*	*
7.46	1417	762	655	305	230	***	408	227	541	112	142	409	9.6	669	8.2	*	*
8.46	1480	784	696	315	241	236	481	246	566	136	200	456	10.3	743	8.8	1	1
9.49	1557	824	733	330	248	245	515	243	570	103	166	482	10.7	916	10.5	2	2
10.05	1611	833	778	332	259	251	528	241	563	81	126	610	12.3	968	11.3	3	3
11.02	1685	877	808	341	266	260	609	254	588	90	132	682	13.1	987	11.9	4	4
11.56	1714	892	822	359	270	261	641	257	604	93	142	699	13.2	999	13.0	4	4
12.50	1746	913	833	370	275	260	722	277	647	130	200	796	14.1	999	13.0	4	5
13.21	1754	919	835	372	272	261	686	268	636	118	186	934	15.2	999	13.0	4	5

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NO:93 GIRL BIRTH WT:1729 SD(ADJ):-4.0 AGE AT MENARCHE:14.7
DIAGNOSIS:L B W RUSSELL FATHERS HT(EST)162.6 MOTHERS HT(EST)160.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
5.75	940	547	393	222	137	***	119	146	280	40	70	243	4.7	215	2.9	*	*
6.23	962	553	409	224	140	***	123	147	285	36	64	292	6.5	283	3.9	*	*
6.65	982	563	419	230	142	***	132	145	289	36	71	300	6.7	386	4.9	*	*
7.11	1004	582	422	236	145	***	138	150	294	36	67	319	7.4	386	4.9	*	*
7.34	1015	575	440	237	146	***	136	151	295	37	67	319	7.4	440	5.6	*	*
7.90	1042	590	452	242	148	***	145	160	312	41	73	319	7.4	477	6.1	*	*
8.35	1062	594	468	245	151	***	148	157	308	38	67	319	7.4	522	6.5	*	*
8.87	1088	609	479	250	153	***	155	156	307	43	67	327	7.6	522	6.5	*	*
9.30	1103	614	489	253	156	***	163	158	319	41	59	342	8.1	614	7.6	*	*
9.79	1125	624	501	259	156	***	170	164	326	41	62	434	10.0	614	7.6	*	*
10.52	1156	643	513	267	160	***	180	169	331	45	68	434	10.0	614	7.6	*	*

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NO:93 GIRL BIRTH WT:1729 SD(ADJ):-4.0 AGE AT MENARCHE:14.7
DIAGNOSIS:L B W RUSSELL FATHERS HT(EST)162.6 MOTHERS HT(EST)160.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
11.02	1179	655	524	274	166	***	200	177	363	51	93	503	11.0	790	9.3	1	1
11.52	1208	666	542	282	170	***	207	183	362	56	87	516	11.2	790	9.3	1	1
12.06	1228	677	551	286	177	***	226	183	370	48	74	547	11.6	976	11.5	2	2
12.30	1251	682	569	291	179	***	235	184	376	49	72	570	11.9	976	11.5	2	3
12.57	1270	693	577	295	182	***	246	193	392	54	75	570	11.9	992	12.2	2	3
12.82	1285	704	581	300	186	***	263	196	399	61	87	641	12.6	999	13.0	2	3
13.09	1303	702	601	304	189	198	272	196	407	65	87	641	12.6	999	13.0	2	3
13.57	1328	722	606	312	195	201	290	202	411	59	85	648	12.7	999	13.0	3	4
14.07	1358	737	621	319	197	203	306	205	421	61	80	681	13.1	999	13.0	3	4
14.59	1376	754	622	327	204	204	340	223	446	72	105	***	****	***	****	4	4
15.10	1384	762	622	334	210	204	370	233	475	90	143	883	14.9	999	13.0	4	5
16.06	1398	780	618	341	212	206	390	238	498	92	133	***	****	***	****	4	5

NO:94 GIRL BIRTH WT:1757 SD(ADJ):-3.1 AGE AT MENARCHE:12.0
DIAGNOSIS:L B W RUSSELL FATHERS HT(EST)165.1 MOTHERS HT(EST)154.9

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
1.81	725	455	270	167	121	***	73	126	232	51	87	135	2.1	164	1.0	*	*
4.00	851	501	350	192	136	***	96	138	242	55	103	201	3.5	193	2.3	*	*
4.92	896	525	371	203	141	***	105	143	258	51	116	208	3.7	272	3.7	*	*
5.28	925	538	387	204	142	***	106	139	253	46	92	217	3.9	288	3.9	*	*
5.53	933	535	398	205	143	***	105	136	253	43	83	223	4.1	340	4.4	*	*
5.83	948	540	408	207	143	***	106	132	247	40	92	***	****	***	****	*	*
6.09	985	559	426	212	147	***	117	141	258	62	100	223	4.1	388	5.0	*	*
6.33	1001	572	429	213	148	***	125	144	270	67	112	223	4.1	399	5.1	*	*
6.58	1021	580	441	216	149	***	124	139	264	50	91	251	5.0	399	5.1	*	*
6.83	1034	586	448	220	153	***	125	140	258	51	84	251	5.0	417	5.3	*	*
7.31	1056	600	456	225	154	***	135	149	274	47	105	290	6.4	485	6.1	*	*
7.79	1082	610	472	232	161	***	134	141	266	47	82	308	7.0	513	6.4	*	*
8.29	1111	618	493	234	159	***	142	144	282	47	86	320	7.4	556	6.9	*	*
8.79	1125	622	503	238	161	***	142	140	277	46	81	336	7.9	575	7.2	*	*
9.04	1136	629	507	241	164	***	146	142	278	53	77	349	8.3	575	7.2	*	*
9.30	1151	643	508	245	168	***	159	147	302	60	95	367	8.8	660	8.1	1	1
9.55	1172	648	524	248	169	***	163	147	305	53	79	385	9.2	713	8.6	1	2
9.82	1187	656	531	253	173	***	176	157	318	63	100	437	10.0	767	9.0	1	2
10.07	1211	669	542	255	173	***	172	149	304	51	73	437	10.0	802	9.4	1	2
10.32	1227	673	554	259	179	178	183	157	318	53	80	466	10.5	848	9.8	2	3
10.80	1270	699	571	267	183	186	200	156	323	52	93	482	10.7	848	9.8	2	4
11.30	1305	717	588	277	189	185	222	164	347	63	87	588	12.0	960	11.2	3	4
11.80	1338	734	604	284	196	189	237	172	356	66	91	602	12.2	976	11.5	4	4
12.31	1364	748	616	292	199	190	267	183	380	81	116	685	13.1	999	13.0	4	5
12.75	1372	760	612	297	205	191	287	189	400	84	117	712	13.4	999	13.0	4	5
13.27	1390	769	621	304	213	194	318	201	438	144	155	795	14.1	999	13.0	4	5
14.27	1391	774	617	306	215	190	329	210	444	122	154	991	15.7	999	13.0	4	5

NO:95 GIRL BIRTH WT:2948 SD(ADJ):-1.0 NO MENARCHE
DIAGNOSIS:TURNER,S SYNDROME FATHERS HT:174.0 MOTHERS HT:158.2

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
2.67	789	483	306	188	146	***	98	148	257	94	97	129	2.0	177	1.8	*	*
3.67	843	504	339	203	155	***	107	153	270	77	90	180	2.9	217	2.9	*	
4.55	894	538	356	213	161	***	120	153	272	64	84	198	3.4	239	3.3	*	
5.80	954	570	384	225	171	***	132	150	281	52	68	231	4.3	356	4.6	*	
6.79	994	583	411	234	176	***	144	149	292	49	64	253	5.1	428	5.5	*	*
7.60	1032	603	429	244	183	***	159	162	308	52	70	303	6.8	543	6.7	*	*
7.85	1048	606	442	248	186	***	168	162	323	68	80	307	7.0	560	7.0	*	*
8.10	1063	621	442	251	188	***	177	172	324	67	83	307	7.0	560	7.0	*	*
8.31	1078	628	450	255	191	***	182	176	330	67	94	318	7.3	584	7.3	*	*
8.67	1100	634	466	260	195	***	203	185	354	86	93	325	7.5	603	7.5	*	*
8.96	1107	639	468	261	195	***	197	183	346	72	90	339	8.0	603	7.5	*	*
9.21	1109	642	467	263	197	***	201	185	348	77	90	339	8.0	603	7.5	*	*
9.48	1121	647	474	264	197	***	200	184	350	80	93	339	8.0	603	7.5	*	*
9.71	1126	650	476	266	199	***	205	186	356	78	90	339	8.0	603	7.5	*	*
9.96	1136	644	492	268	201	***	210	183	357	79	84	339	8.0	657	8.1	*	*
10.17	1142	650	492	272	203	***	209	186	354	81	85	346	8.2	735	8.7	1	1
10.42	1154	655	499	275	205	***	220	189	363	91	89	383	9.1	735	8.7	1	1
10.70	1161	663	498	276	206	***	223	188	366	79	90	412	9.6	773	9.1	1	1
11.22	1174	666	508	279	210	***	234	200	379	98	110	433	10.0	773	9.1	*	*
11.64	1179	674	505	280	210	***	244	208	391	120	132	440	10.1	809	9.4	*	*
12.39	1204	682	522	286	215	***	258	212	399	122	123	448	10.2	871	10.0	1	1
13.37	1238	686	552	291	217	207	283	223	421	138	142	448	10.2	871	10.0	1	1
14.09	1256	695	561	***	***	***	326	***	***	190	170	460	10.4	894	10.2	*	*
14.79	1273	695	578	302	230	212	308	222	432	137	153	494	10.9	894	10.2	1	1
16.42	1293	699	594	310	236	212	325	235	446	135	152	540	11.5	989	12.0	1	1
16.63	1300	704	596	311	239	214	336	227	450	148	152	540	11.5	989	12.0	1	3
17.06	1318	721	597	314	246	227	346	226	443	170	150	685	13.1	999	13.0	2	3
17.32	1323	730	593	***	***	***	***	***	***	***	***	***	****	***	****	*	*
18.09	1335	733	602	***	***	***	***	***	***	***	***	745	13.7	999	13.0	*	*

NO:96 GIRL BIRTH WT:3600 SD(ADJ): .4 NO MENARCHE
DIAGNOSIS:TURNER,S SYNDROME FATHERS HT(EST)167.6 MOTHERS HT(EST)160.0

AGE (years)	STATURE (mm)	SITTING HEIGHT (mm)	SUBISCHIAL LEG LENGTH (mm)	BIACROMIAL DIAMETER (mm)	BIILIAC DIAMETER (mm)	FOOT LENGTH (mm)	WEIGHT (0·1 kg)	UPPER ARM CIRCUM. (mm)	THIGH CIRCUM. (mm)	SUBSCAPULAR SKINFOLD (0·1 mm)	TRICEPS SKINFOLD (0·1 mm)	RUS SCORE (units)	RUS BONE AGE ("years")	CARPAL SCORE (units)	CARPAL BONE AGE ("years")	GENITALIA/BREAST RATING	PUBIC HAIR RATING
10.05	1097	642	455	252	191	***	183	171	340	53	70	314	7.2	701	8.5	*	*
10.41	1107	648	459	256	192	***	187	175	352	50	70	314	7.2	718	8.6	*	*
10.89	1124	657	467	261	198	***	218	190	377	74	85	329	7.7	759	9.0	*	*
11.04	1130	660	470	263	198	***	216	190	379	69	84	340	8.0	813	9.4	*	*
11.30	1140	663	477	264	201	***	223	185	378	71	58	340	8.0	871	10.0	*	*
11.56	1156	669	487	267	204	***	235	194	391	67	70	340	8.0	871	10.0	*	*
11.80	1165	672	493	272	205	***	232	187	383	72	71	369	8.8	894	10.2	*	*
12.10	1174	675	499	272	209	***	235	189	391	67	69	390	9.3	909	10.4	*	*
12.31	1181	677	504	274	210	***	237	191	392	62	75	404	9.5	909	10.4	*	*
12.56	1185	680	505	273	210	***	238	194	386	66	79	448	10.2	930	10.7	*	*
12.81	1188	679	509	276	210	***	238	192	391	62	80	456	10.3	930	10.7	*	*
13.12	1198	692	506	274	212	***	245	199	397	84	83	463	10.4	952	11.0	*	*
13.35	1200	683	517	277	215	***	245	199	399	64	80	463	10.4	952	11.0	*	*
13.98	1214	691	523	279	216	***	255	202	406	69	80	484	10.7	952	11.0	1	1
14.98	1234	702	532	288	224	***	278	209	429	82	97	507	11.0	992	12.2	1	1
15.55	1262	723	539	296	238	***	326	229	460	97	94	599	12.2	999	13.0	4	4
16.22	1273	729	544	298	243	***	323	222	455	91	92	***	****	***	****	4	4
16.74	1283	734	549	303	245	***	330	224	467	71	91	752	13.7	999	13.0	*	*
17.72	1298	746	552	303	247	195	349	236	475	88	111	887	14.9	999	13.0	4	5

SMALL/DELAY = CONSTITUTIONAL GROWTH DELAY; L B W RUSSELL = SILVER-RUSSELL SYNDROME.